Chiral Lagrangians with decuplet baryons to one loop

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We construct the relativistic chiral Lagrangians with decuplet baryons up to the order $\mathcal{O}(p^4)$ (one loop). For the meson-decuplet-decuplet couplings, there are 1, 13, 55, and 548 terms in the $\mathcal{O}(p^1)-\mathcal{O}(p^4)$ order Lagrangians, respectively. For the meson-octet-decuplet Lagrangians, the number of independent terms from $\mathcal{O}(p^1)$ to $\mathcal{O}(p^4)$ is 1, 5, 67, and 611, respectively. For convenience of application, the $\pi\Delta\Delta$ and $\pi N\Delta$ chiral Lagrangians are picked out. This new form of Δ Lagrangians is equivalent to the original isovector-isospinor one, and we establish relations between these two forms.

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I. INTRODUCTION

Chiral perturbation theory (ChPT) is a useful tool to describe low-energy strong interactions of mesons [1–3] and baryons [4]. This effective theory is based on the chiral symmetry of QCD and its spontaneous breaking. The interaction terms and various physical quantities in this theory are organized perturbatively by chiral dimension, the order of p/Λ_χ where p represents the typical scale of momentum and Λ_χ is the scale of chiral symmetry breaking. Theoretically, the higher the chiral dimension terms, the more precise the obtained results. At present, the chiral Lagrangians containing the pseudoscalar mesons [2,3,5–12] and the ground state baryons [4,13–20] [both SU(2) and SU(3)] have been already constructed to the sixth and fourth order, respectively. Recently, the chiral Lagrangians with $\Delta(1232)$ were also considered up to the fourth chiral order [21,22]. For the purpose of application, the current existent chiral Lagrangians are precise enough for theoretical studies on low-energy interactions. However, the above investigations missed a kind of particles, the spin-3/2 hyperons.

In reality, a lot of low-energy QCD problems are related to the chiral Lagrangians with decuplet states which are degenerate with the octet baryons in the large N_c limit. Such problems include: the masses of the octet/decuplet baryons and the mass relations between octet/decuplet baryons [23–26], the electromagnetic structures of octet and decuplet baryons (magnetic moments, electric quadrupole moments, and electromagnetic form factors) [27–30], the meson-octet/decuplet scattering processes [31,32], the transitions from decuplet states to octet states [33,34], lattice studies of baryon properties [35–37], and so on. Especially, the studies of the transitions between decuplet and octet baryons can shed light on the possible dibaryons [38]. The lowest-order chiral Lagrangian with decuplet states is obtained easily [39], but we find only fragmentary results for high-order terms in the literature (see the references mentioned above). Such Lagrangians are constructed in order to focus on special problems. A complete and minimal set of Lagrangians with decuplet baryons is still needed. One purpose in this paper is to construct the chiral Lagrangians with the decuplet baryons to one loop (the fourth chiral order) systematically.

In the SU(2) case, we have obtained the chiral Lagrangians with Δ up to the order $\mathcal{O}(p^4)$ [22], where we use the isovector-isospinor representation [40] in the isospin space for the Rarita-Schwinger (RS) fields. The application of such Lagrangians is not so convenient in some cases. On the other hand, in the SU(3) case, the decuplet baryons are represented in the flavor space as a totally symmetric tensor T_{abc}. Since the Δ baryons are members of the decuplet representation, the Lagrangians with Δ can also be expressed with the symmetric tensor. However, it is apparently not straightforward to make a relation between these two formalisms. Another purpose of the present study is to give new chiral Lagrangians with Δ in the form of T_{abc} $(a,\ b,\ c=1,\ 2)$ and establish the relations to the former formalism.

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This paper is organized as follows. In Sec. II, we review the building blocks for the construction of the chiral Lagrangians with the mesons, the external sources, and a part of the building blocks with baryon fields. In Sec. III, we present the structures of the chiral Lagrangians and give full building blocks with baryon fields. In Sec. IV, the properties of the building blocks, the linear relations of invariant monomials, and the relations between the original chiral Lagrangians with Δ and the new forms are given. In Sec. V, we list our results and present some discussions. Section VI is a short summary.

II. BUILDING BLOCKS IN CONSTRUCTING CHIRAL LAGRANGIANS

Generally speaking, the constructed Lagrangians in ChPT involve the pseudoscalar mesons, the external sources, the decuplet baryons, and the octet baryons. In this section, we present appropriate building blocks in constructing the chiral Lagrangians. More detailed discussions about them can be found in Refs. [2–6,9,10,12,17,18,20–22]. For the spin-3/2 baryon states, we consider both $SU(3)$ and $SU(2)$ cases. For convenience, we simply call the form of chiral Lagrangians with Δ in Ref. [22] "original" and those in this paper "new." Needless to say, the new form $SU(2)$ Lagrangians are just selected terms of the $SU(3)$ Lagrangians with decuplet baryons. Hence, in the following parts, we treat them in the same way.

A. Building blocks of the mesons and the external sources

The QCD Lagrangian $\mathcal{L}$ can be written as

$$\mathcal{L} = \mathcal{L}^0_{\rm QCD} + \bar{q}(\not{v} + \not{a}\gamma_5 - s + ip\gamma_5)q, \tag{1}$$

where $\mathcal{L}^0_{\rm QCD}$ is the original QCD Lagrangian and q denotes the quark field. We use s, p, v^μ, and a^μ to denote scalar, pseudoscalar, vector, and axial-vector external sources, respectively. Conventionally, the tensor source and the θ term are ignored. As usual, we consider that only a^μ is traceless in the two-flavor case, but both a^μ and v^μ are traceless in the three-flavor case.

In ChPT, the pseudoscalar mesons (Goldstone bosons) come from the spontaneous breaking of the global symmetry $SU(N_f)_L \times SU(N_f)_R$ into $SU(N_f)_V$. The resulting meson fields are collected in u, and it transforms as

$$u \to g_L u h^\dagger = h u g_R^\dagger \tag{2}$$

under the chiral rotation, where g_L and g_R represent elements in $SU(N_f)_L$ and $SU(N_f)_R$, respectively, and h is a compensator field which is a function of the pion fields.

To construct the chirally invariant Lagrangians involving only meson fields and external sources, the building blocks are usually chosen as

$$\begin{aligned}
u^\mu &= i\{u^\dagger(\partial^\mu - ir^\mu)u - u(\partial^\mu - il^\mu)u^\dagger\},\\
\chi_\pm &= u^\dagger\chi u^\dagger \pm u\chi^\dagger u,\\
h^{\mu\nu} &= \nabla^\mu u^\nu + \nabla^\nu u^\mu,\\
f_+^{\mu\nu} &= uF_L^{\mu\nu}u^\dagger + u^\dagger F_R^{\mu\nu}u,\\
f_-^{\mu\nu} &= uF_L^{\mu\nu}u^\dagger - u^\dagger F_R^{\mu\nu}u = -\nabla^\mu u^\nu + \nabla^\nu u^\mu,
\end{aligned} \tag{3}$$

where $r^\mu = v^\mu + a^\mu$, $l^\mu = v^\mu - a^\mu$, $\chi = 2B_0(s + ip)$, $F_R^{\mu\nu} = \partial^\mu r^\nu - \partial^\nu r^\mu - i[r^\mu, r^\nu]$, $F_L^{\mu\nu} = \partial^\mu l^\nu - \partial^\nu l^\mu - i[l^\mu, l^\nu]$, and B_0 is a constant related to the quark condensate. The form of these building blocks, however, is not very useful in the construction of chiral Lagrangians with decuplet baryons. For convenience, we write the flavor indices of these building blocks (or any other matrices in the flavor space) explicitly,

$$X = X_a{}^b + X_s I, \qquad X_s = \frac{1}{N_f}\langle X\rangle, \tag{4}$$

where X denotes any building block in Eq. (3) (or any matrix in the flavor space), $X_a{}^b$ (X_s) is the traceless (traceable) part of X, I is the $N_f \times N_f$ identity matrix in the N_f-flavor space, and $\langle\cdots\rangle$ means the trace in the flavor space. We use a and b (a, $b = 1, 2, 3$) to denote the row index and column index of the matrix X, respectively. In the following, we will treat the row index (or the first index) of $X_a{}^b$ as the subscript and the column index (or the second index) as the superscript. According to these notations, we have $u_s^\mu = f_{-,s}^{\mu\nu} = h_s^{\mu\nu} = 0$ in the two-flavor case and an additional relation $f_{+,s}^{\mu\nu} = 0$ in the three-flavor case. The chiral transformations (R) for these building blocks are

$$\begin{aligned}
X_a{}^b &\xrightarrow{R} X'_a{}^b = h_a{}^{a'} X'_{a'}{}^{b'} h^\dagger{}_{b'}{}^b,\\
X_s &\xrightarrow{R} X'_s = X_s.
\end{aligned} \tag{5}$$

Here $h_a{}^{a'}$ does not need to be traceless as the definition of $X_a{}^b$ in Eq. (4). The row index of $X_a{}^b$ is related to the h field, but the column index is related to the $h^\dagger$ field.

The covariant derivative ∇^μ acting on the building blocks in Eq. (5) is

$$\begin{aligned}
\nabla^\mu X_a{}^b &= \partial^\mu X_a{}^b + \Gamma_a{}^{c,\mu} X_c{}^b - X_a{}^c \Gamma_c{}^{b,\mu},\\
\nabla^\mu X_s &= \partial^\mu X_s,\\
\Gamma^\mu &= \frac{1}{2}\{u^\dagger(\partial^\mu - ir^\mu)u + u(\partial^\mu - il^\mu)u^\dagger\}.
\end{aligned} \tag{6}$$

In constructing the Lagrangian, the following two relations will be useful:

$$[\nabla^\mu, \nabla^\nu]X_a{}^b = \Gamma_a{}^{c,\mu\nu} X_c{}^b - X_a{}^c \Gamma_c{}^{b,\mu\nu}, \tag{7}$$

$$[\nabla^\mu, \nabla^\nu]X_s = 0, \tag{8}$$

$$\Gamma^{\mu\nu} = \nabla^\mu\Gamma^\nu - \nabla^\nu\Gamma^\mu - [\Gamma^\mu, \Gamma^\nu] = \frac{1}{4}[u^\mu, u^\nu] - \frac{i}{2}f_+^{\mu\nu}. \tag{9}$$

B. Building blocks of baryons

Besides the meson fields and external fields, we also need baryons belonging to $SU(3)$ eight and ten representations. The octet baryons are represented by a matrix ${B_a}^b$,

$$ {B_a}^b = \begin{pmatrix} \frac{\Sigma^0}{\sqrt{2}} + \frac{\Lambda}{\sqrt{6}} & \Sigma^+ & p \\ \Sigma^- & -\frac{\Sigma^0}{\sqrt{2}} + \frac{\Lambda}{\sqrt{6}} & n \\ \Xi^- & \Xi^0 & -\frac{2\Lambda}{\sqrt{6}} \end{pmatrix}. \tag{10} $$

In the two-flavor case, it is reduced to the nucleon doublet,

$$ \psi_a = \begin{pmatrix} p \\ n \end{pmatrix}. \tag{11} $$

One may also use the symbol ${B_a}^3$ $(a = 1, 2)$ to denote this nucleon doublet. For the decuplet baryons, they are denoted by a totally symmetrical tensor T_{abc} with

$$ \begin{aligned} &T_{111} = \Delta^{++}, \quad T_{112} = \frac{\Delta^+}{\sqrt{3}}, \quad T_{122} = \frac{\Delta^0}{\sqrt{3}}, \quad T_{222} = \Delta^-, \\ &T_{113} = \frac{\Sigma^{*+}}{\sqrt{3}}, \quad T_{123} = \frac{\Sigma^{*0}}{\sqrt{6}}, \quad T_{223} = \frac{\Sigma^{*-}}{\sqrt{3}}, \\ &T_{133} = \frac{\Xi^{*0}}{\sqrt{3}}, \quad T_{233} = \frac{\Xi^{*-}}{\sqrt{3}}, \quad T_{333} = \Omega^-. \end{aligned} $$

In the $SU(2)$ case, only the first four fields are needed.

The chiral transformations for these baryon fields are

$$ \begin{aligned} {B_a}^b &\xrightarrow{R} {B'_a}^b = {h_a}^{a'} {B_{a'}}^{b'} {h^\dagger}_{b'}{}^b, \\ \psi_a &\xrightarrow{R} \psi'_a = {h_a}^b \psi_b, \\ T_{abc} &\xrightarrow{R} T'_{abc} = {h_a}^{a'} {h_b}^{b'} {h_c}^{c'} T_{a'b'c'}, \\ {\bar{B}_a}^b &\xrightarrow{R} {\bar{B}'_a}^b = {h_a}^{a'} {\bar{B}_{a'}}^{b'} {h^\dagger}_{b'}{}^b, \\ \bar{\psi}^a &\xrightarrow{R} \psi'^a = \bar{\psi}^b {h^\dagger}_b{}^a, \\ \bar{T}^{abc} &\xrightarrow{R} \bar{T}'^{abc} = \bar{T}^{a'b'c'} {h^\dagger}_{a'}{}^a {h^\dagger}_{b'}{}^b {h^\dagger}_{c'}{}^c. \end{aligned} \tag{12} $$

From the transformations, the indices of ψ_a and T_{abc} ($\bar{\psi}^a$ and $\bar{T}^{abc}$) can be treated as row (column) indices and those of ${B_a}^b$ and ${\bar{B}_a}^b$ are self-evident. From Eqs. (5) and (12), we can see that if a term is chirally invariant, all the row indices must be contracted with the column indices and vice versa. This is the reason why we write the row and column indices explicitly.

The covariant derivative D^μ acting on the baryon fields is [15,18,27]

$$ \begin{aligned} D^\mu \psi_a &= \partial^\mu \psi_a + {\Gamma_a}^{b,\mu} \psi_b, \\ D^\mu {B_a}^b &= \partial^\mu {B_a}^b + {\Gamma_a}^{c,\mu} {B_c}^b - {B_a}^c {\Gamma_c}^{b,\mu}, \\ D^\mu T_{abc} &= \partial^\mu T_{abc} + {\Gamma_a}^{d,\mu} T_{dbc} + {\Gamma_b}^{d,\mu} T_{adc} + {\Gamma_c}^{d,\mu} T_{abd}. \end{aligned} \tag{13} $$

It seems that, in the three- (two)-flavor case, we can choose T^μ_{abc}, $\bar{T}^{abc,\mu}$, ${B_a}^b$, ${\bar{B}_a}^b$ (T^μ_{abc}, $\bar{T}^{abc,\mu}$, ψ_a, $\bar{\psi}^a$), and their covariant derivatives as building blocks, but it is a bit more complex for the spin-3/2 RS fields. We will discuss this issue in the next section.

III. STRUCTURES OF CHIRAL LAGRANGIANS WITH DECUPLET BARYONS

A similar discussion in this section has been presented in Ref. [22]. Here we only list the necessary ingredients for the Lagrangian construction. More details can be found in Refs. [17–21,40–56].

In this paper, we adopt the vector-spinor representation Ψ^μ $(\mu = 0, 1, 2, 3)$ [41] for the spin-3/2 fields. The general Lagrangian for a free RS field with mass m reads [42]

$$ \begin{aligned} \mathcal{L}_{\rm f} &= \bar{\Psi}_\mu \Lambda^{\mu\nu}_A \Psi_\nu, \\ \Lambda^{\mu\nu}_A &= -\Big[(i\partial\!\!\!/ - m) g^{\mu\nu} + iA(\gamma^\mu \partial^\nu + \gamma^\nu \partial^\mu) \\ &\quad + \frac{i}{2}(3A^2 + 2A + 1)\gamma^\mu \partial\!\!\!/ \gamma^\nu \\ &\quad + m(3A^2 + 3A + 1)\gamma^\mu \gamma^\nu \Big], \end{aligned} \tag{14} $$

where $A \neq -1/2$ is an arbitrary real number. From this Lagrangian, one derives the equation of motion (EOM) and two subsidiary conditions:

$$ (i\partial\!\!\!/ - m)\Psi_\mu = 0, \tag{15} $$

$$ \gamma^\mu \Psi_\mu = 0, \tag{16} $$

$$ \partial^\mu \Psi_\mu = 0. \tag{17} $$

The two unphysical spin-$\frac{1}{2}$ degrees of freedom in the vector-spinor representation can be eliminated with these two subsidiary conditions.

There exists a so-called "point" or "contact" transformation under which the above Lagrangian is invariant,

$$ \Psi_\mu \to \Psi'_\mu = \Psi_\mu + \frac{1}{2} a \gamma_\mu \gamma_\nu \Psi^\nu, \tag{18} $$

$$ A \to A' = \frac{A - a}{1 + 2a}, \qquad a \neq -\frac{1}{2}. \tag{19} $$

The choice for the value of A does not affect physical quantities [50,55,57]. Therefore, one may simplify the above Lagrangian by a field redefinition [48],

$$ \begin{aligned} \mathcal{L}_{\rm f} &= \bar{\Psi}_{A\mu} \Lambda^{\mu\nu} \Psi_{A\nu}, \\ \Lambda^{\mu\nu} &= -(i\partial\!\!\!/ - m) g^{\mu\nu} + \frac{1}{4} \gamma^\mu \gamma^\lambda (i\partial\!\!\!/ - m) \gamma_\lambda \gamma^\nu, \end{aligned} \tag{20} $$

where $\psi_A^\mu \equiv O_A^{\mu\nu}\Psi_\nu = (g^{\mu\nu} + \frac{1}{2}A\gamma^\mu\gamma^\nu)\Psi_\nu$. Now, $\Lambda^{\mu\nu}$ is independent of A, and the A dependence is implied in ψ_A^μ.

For the meson-decuplet-decuplet (MTT) interactions, the chiral Lagrangian has the form

$$\mathcal{L}_{\rm MTT} = \bar{T}_\mu^{abc}\Lambda_{A,abc}^{def,\mu\nu}T_{def,\nu}, \tag{21}$$

$$\begin{aligned}\Lambda_{A,abc}^{def,\mu\nu} = -\Big[&(i\not{D} - m_T)g^{\mu\nu} + iA(\gamma^\mu D^\nu + \gamma^\nu D^\mu) \\ &+ \frac{i}{2}(3A^2 + 2A + 1)\gamma^\mu \not{D}\gamma^\nu \\ &+ m_T(3A^2 + 3A + 1)\gamma^\mu\gamma^\nu\Big]\delta_a{}^d\delta_b{}^e\delta_c{}^f \\ &+ O_{1,A,abc}^{def,\mu\nu},\end{aligned} \tag{22}$$

where m_T is the decuplet mass in the $SU(3)$ limit and $O_{1,A,abc}^{def,\mu\nu}$ contains the meson fields and the external sources. Then the EOM and the subsidiary conditions in ChPT are

$$(i\not{D} - m_T)T_{abc}^\mu \doteq 0, \tag{23}$$

$$D_\mu T_{abc}^\mu \doteq 0, \tag{24}$$

$$\gamma_\mu T_{abc}^\mu \doteq 0, \tag{25}$$

where the symbol "$\doteq$" means that both sides are equal if high-order terms are ignored. We may write the structure of any term in $O_{1,abc}^{def,\mu\nu}$ as [17,21,22]

$$\bar{T}^{abc,\mu}O^{\cdots}\Theta^{\cdots}T_{def}^\nu + \text{H.c.}, \tag{26}$$

where $\cdots$ denotes suitable flavor and Lorentz indices, $O^{\cdots}$ is the product of the building blocks with the meson fields and the external sources in Sec. II A, and $\Theta^{\cdots}$ contains a Clifford algebra element $\Gamma \in \{1, \gamma_\mu, \gamma_5, \gamma_5\gamma_\mu, \sigma_{\mu\nu}\}$, the Levi-Civita tensors in Lorentz space $\epsilon^{\mu\nu\lambda\rho}$, and the covariant derivatives acting on T_{def}^ν. Up to the order $\mathcal{O}(p^4)$, the structures of $\Theta^{\cdots}$ can be found below Eq. (49) in Ref. [22].

With the structure in Eq. (26), the low-energy constants (LECs) in $O_{1,abc}^{def,\mu\nu}$ are dependent on A. One can absorb the parameter A into the redefined RS fields according to the point transformation [Eqs. (18) and (20)]. Then the Lagrangian (22) can be rewritten as

$$\begin{aligned}\mathcal{L}_{\rm MTT} = &-\bar{T}_{A,\mu}^{abc}\left[(i\not{D} - m_T)g^{\mu\nu} - \frac{1}{4}\gamma^\mu\gamma^\lambda(i\not{D} - m_T)\gamma_\lambda\gamma^\nu\right]T_{A,abc,\nu} \\ &+ \bar{T}_{A,\mu}^{abc}O_{1,abc}^{def,\mu\nu}T_{A,def,\nu},\end{aligned} \tag{27}$$

where $T_{A,abc}^\mu = O_A^{\mu\nu}T_{abc,\nu}$. Now, the LECs in Eq. (27) are independent of A, but the invariant monomials have the same structures as those in Eq. (22); i.e., one may get Eq. (27) from Eq. (22) by changing $T_{abc,\mu}$ to $T_{A,abc,\mu}$ only. The LECs in these two equations are equal if $A = 0$. Physically, we can choose any value of A ($A \neq -1/2$) ($A = -1$ is a simple and widely used value). In the final results (Sec. V), we only give the structures in Eq. (22).

The new form $\pi\Delta\Delta$ Lagrangians are very similar to the MTT Lagrangians. The differences lie only in the baryon mass and the flavor indices. By changing m_T to m_Δ (Δ mass in the chiral limit) and limiting all the flavor indices to 1 and 2, the new form of $\pi\Delta\Delta$ Lagrangians is obtained.

For the meson-octet-decuplet and $\pi N\Delta$ interactions, the chiral Lagrangians have the following structures, respectively,

$$\epsilon^{abc}\bar{B}_d{}^e O^{\cdots}\Theta^{\cdots}T_{A,n,fgh}^\mu + \text{H.c.}, \tag{28}$$

$$\epsilon^{ab}\bar{\psi}^c O^{\cdots}\Theta^{\cdots}T_{A,n,def}^\mu + \text{H.c.}, \tag{29}$$

where $O^{\cdots}$ and $\Theta^{\cdots}$ have the same meanings as those in Eq. (26). For the Levi-Civita tensor, we have column indices in ϵ^{abc} (a, b, $c = 1$, 2, 3) and row indices in ϵ_{abc} (in the H.c. part). Here, $\epsilon^{ab} \equiv \epsilon^{ab3}$. The RS field depending on A is defined through

$$T_{A,n,fgh,\mu} = \Theta_{A,n,\mu\nu}(z_n)T_{fgh}^\nu, \tag{30}$$

$$\begin{aligned}\Theta_{A,n,\mu\nu}(z_n) &= g_{\mu\nu} + \left[z_n + \frac{1}{2}(1 + 4z_n)A\right]\gamma_\mu\gamma_\nu \\ &\equiv \Theta_{n,\mu\alpha}(z_n)O_{A\nu}^\alpha = O_{A\mu}{}^\alpha\Theta_{n,\alpha\nu}(z_n), \\ \Theta_{n,\mu\alpha}(z_n) &\equiv g_{\mu\alpha} + z_n\gamma_\mu\gamma_\alpha.\end{aligned} \tag{31}$$

Some z_n parameters are needed because of the point transformation [58]. They can be obtained from experiments. In Eqs. (28) and (29), the point-invariant structures have been implied and the LECs are already independent of A.

To construct Lagrangians, for the baryon fields, we choose T_{abc}^μ, $\bar{T}^{abc,\mu}$, $T_{A,abc}^\mu$, $\bar{T}_A^{abc,\mu}$, $B_a{}^b$, $\bar{B}_a{}^b$, and their covariant derivatives as building blocks in the three-flavor case. In the two-flavor case, we adopt T_{abc}^μ, $\bar{T}^{abc,\mu}$, $T_{A,abc}^\mu$, $\bar{T}_A^{abc,\mu}$, ψ_a, $\bar{\psi}^a$, and their covariant derivatives.

IV. PREPARATIONS FOR LAGRANGIAN CONSTRUCTION

In this section, we make preparations for the construction of chiral Lagrangians with decuplet baryons. The new form of chiral Lagrangians with Δ is understood. The recipes are very similar to those in constructing Lagrangians for mesons, meson-baryon systems, and the $\pi - N - \Delta$ systems in Refs. [12,20,22].

A. Power counting and transformation properties

The chiral dimensions [2–4,6,17,18] of the building blocks with the external sources are listed in the second column of Table I and those of the Clifford algebra and the

TABLE I. Chiral dimension (Dim), parity (P), charge conjugation (C), and Hermiticity (H.c.) of the building blocks with the external sources.

	Dim	P	C	H.c.
${u_a}^{b,\mu}$	1	$-{u_a}^b{}_\mu$	${u_b}^{a,\mu}$	${u_a}^{b,\mu}$
${h_a}^{b,\mu\nu}$	2	$-{h_a}^b{}_{\mu\nu}$	${h_b}^{a,\mu\nu}$	${h_a}^{b,\mu\nu}$
${\chi_{\pm,a}}^b$	2	$\pm{\chi_{\pm,a}}^b$	${\chi_{\pm,b}}^a$	$\pm{\chi_{\pm,a}}^b$
$\chi_{\pm,s}$	2	$\pm\chi_{\pm,s}$	$\chi_{\pm,s}$	$\pm\chi_{\pm,s}$
${f_{\pm,a}}^{b,\mu\nu}$	2	$\pm{f_{\pm,a}}^b{}_{\mu\nu}$	$\mp{f_{\pm,b}}^{a,\mu\nu}$	${f_{\pm,a}}^{b,\mu\nu}$
${f_{+,s}}^{\mu\nu}$	2	$f_{+,s,\mu\nu}$	$-{f_{+,s}}^{\mu\nu}$	${f_{+,s}}^{\mu\nu}$

Levi-Civita tensors are given in the second column of Table II [17,18,56]. The baryon fields are chiral dimensionless and the information is not shown in these tables. The covariant derivatives acting on the meson fields and the external sources are counted as $\mathcal{O}(p^1)$, but those acting on the baryon fields are counted as $\mathcal{O}(p^0)$.

The chiral Lagrangian should be invariant under the chiral rotation (R), parity transformation (P), charge conjugation transformation (C), and Hermitian transformation (h.c.). The chiral rotations for the building blocks have been discussed in Eqs. (5) and (12). The P, C, and h.c. transformations are almost the same as those in Ref. [22] and we also present such properties in Tables I and II. Only different properties will be mentioned.

Compared with Table I of Ref. [22], Table I here shows the flavor indices explicitly. The meanings of plus and minus signs in Table II are the same as those in Refs. [17,20,22]. One thing different is the ϵ^{ijk}. This symbol in Ref. [22] is in the isovector space and it absorbs a minus sign in C transformations (Eq. (31) of Ref. [22]). But now ϵ^{abc} and ϵ^{ab} are the Levi-Civita tensors in the three- (two)-flavor space. They do not need to absorb an extra minus sign.

TABLE II. Chiral dimension (Dim), parity (P), charge conjugation (C), and Hermiticity (H.c.) of the Clifford algebra elements, the Levi-Civita tensors, and the covariant derivatives. The subscript "TT" ("BT") denotes the meson-decuplet-decuplet (meson-octet-decuplet) interactions in the three flavors ($\pi\Delta\Delta$ ($\pi N\Delta$) interactions in the two-flavor case). Ψ denotes any baryon field, decuplet baryon, Δ, octet baryon, or nucleon. ϵ^{abc} (ϵ^{ab}) is the Levi-Civita tensor in three- (two)-flavor space. The meaning of the plus or minus sign is explained in the text.

	Dim	$P_{\rm TT}$	$C_{\rm TT}$	H.c.$_{\rm TT}$	$P_{\rm BT}$	$C_{\rm BT}$	H.c.$_{\rm BT}$
1	0	+	+	+	−	+	+
γ_5	1	−	+	−	+	+	−
γ^μ	0	+	−	+	−	−	+
$\gamma_5\gamma^\mu$	0	−	+	+	+	+	+
$\sigma^{\mu\nu}$	0	+	−	+	−	−	+
$\epsilon^{\mu\nu\lambda\rho}$	0	−	+	+	−	+	+
ϵ^{abc}	0	+	+	+	+	+	+
ϵ^{ab}	0	+	+	+	+	+	+
$D^\mu\Psi$	0	+	−	−	+	+	+

B. Linear relations

Some linear relations exist in reducing the chiral-invariant terms to a minimal set. The relations coming from partial integration, EOM, covariant derivatives, and Bianchi identity are the same as those in Ref. [22]. The relations coming from the Cayley-Hamilton relation are the same as those in Ref. [6]. We will not discuss them any more and we only focus on the different and new relations in the following parts.

1. Schouten identity

The Schouten identity in the Lorentz space is the same as that in Ref. [22], but some differences exist in the flavor space. For the Levi-Civita tensor ϵ^{abc} (ϵ^{ab}) in the three- (two)-flavor space, the Schouten identities for any operator A are

$$\begin{aligned} 0 &= \epsilon_{abc}A_d - \epsilon_{dbc}A_a - \epsilon_{adc}A_b - \epsilon_{abd}A_c, \\ 0 &= \epsilon_{ab}A_c - \epsilon_{cb}A_a - \epsilon_{ac}A_b. \end{aligned} \tag{32}$$

There are two types of indices in A (row or column). Equation (32) works only for the case that the indices in the Levi-Civita tensor and the indices in A are the same type.

2. Fierz transformations

The basic Fierz transformation for the Pauli matrices is

$$\tau^i_{ab}\tau^i_{cd} = 2\delta_{ad}\delta_{cb} - \delta_{ab}\delta_{cd}. \tag{33}$$

With this equation, for any two 2×2 building blocks ${X_a}^b$ and ${Y_a}^b$ in Table I, one may obtain [59]

$$\begin{aligned} {X_a}^d{Y_b}^e = \frac{1}{2}({Y_a}^e{X_b}^d + {X_a}^e{Y_b}^d + {X_c}^f{Y_f}^c\delta_a{}^e\delta_b{}^d \\ - {X_c}^f{Y_f}^c\delta_a{}^d\delta_b{}^e + {X_a}^c{Y_c}^e\delta_b{}^d - \delta_a{}^e{X_b}^c{Y_c}^d). \end{aligned} \tag{34}$$

The basic Fierz transformation for the Gall-Mann matrices is

$$\lambda^i_{ac}\lambda^i_{bd} = 2\delta_{ad}\delta_{cb} - \frac{2}{3}\delta_{ac}\delta_{bd}. \tag{35}$$

With the relation in Ref. [60] and the properties of the structure constants of $SU(3)$, one finds that the following relation exists for any two 3×3 building blocks ${X_a}^b$ and ${Y_a}^b$ in Table I,

$$\begin{aligned} 0 = {X_a}^b{Y_c}^d - {X_a}^d{Y_c}^b - {X_c}^b{Y_a}^d + {X_c}^d{Y_a}^b + {X_a}^e{Y_e}^b\delta_c{}^d \\ - {X_a}^e{Y_e}^d\delta_c{}^b - {X_c}^e{Y_e}^b\delta_a{}^d + {X_c}^e{Y_e}^d\delta_a{}^b + \delta_a{}^b{Y_c}^e{X_e}^d \\ - \delta_a{}^d{Y_c}^e{X_e}^b - \delta_c{}^b{Y_a}^e{X_e}^d + \delta_c{}^d{Y_a}^e{X_e}^b - {X_e}^f{Y_f}^e\delta_a{}^b\delta_c{}^d \\ + {X_e}^f{Y_f}^e\delta_a{}^d\delta_c{}^b. \end{aligned} \tag{36}$$

3. Contact terms

The method to construct contact terms is the same as that in Ref. [22]. In the two- (three)-flavor case, the total number of the contact terms is six (five) and we list them in the end of Table V. The last term in Table V is at the $\mathcal{O}(p^6)$ order in the $SU(3)$ case.

C. Relations between the original chiral Lagrangians with Δ and the new ones

In Ref. [22], we have obtained the chiral Lagrangians with Δ to one loop. There, the Δ fields are represented by an isovector-isospinor RS field ψ_i^μ ($i = 1, 2, 3$). Now, we use a totally symmetrical tensor T^μ_{abc} (a, b, $c = 1, 2$) to represent them. The difference lies only in the flavor representations. By some calculations, one gets the following relations between these two formalisms of interaction terms,

$$\bar{T}^{abc} O T_{abc} = \bar{\psi}_i O \psi_i, \tag{37}$$

$$\bar{T}^{abe} O_e{}^f T_{abf} = \bar{\psi}_i O_j \tau_j \psi_i, \tag{38}$$

$$\bar{T}^{abc} X_b{}^e Y_c{}^f T_{aef} = \bar{\psi}_i X_j Y_j \psi_i - \bar{\psi}_i X_i Y_j \psi_j - \bar{\psi}_i X_j Y_i \psi_j, \tag{39}$$

$$\bar{T}^{abc} X_a{}^d Y_b{}^e Z_c{}^f T_{def} = \frac{1}{6} \bar{\psi}_i X_l Y_j \tau_j Z_l \psi_i - \frac{1}{3} \bar{\psi}_i X_i Y_k \tau_k Z_j \psi_j + P(X, Y, Z), \tag{40}$$

$$\epsilon^{ab} \bar{\psi}^c O_a{}^f T_{bcf} = \sqrt{2} \bar{\psi} O_i \psi_i, \tag{41}$$

$$\epsilon^{ab} \bar{\psi}^c X_a{}^e Y_c{}^f T_{ebf} = \sqrt{2} \bar{\psi} X_i Y_j \tau_j \psi_i, \tag{42}$$

$$\epsilon^{ab} \bar{\psi}^c X_a{}^e Y_b{}^f T_{efc} = \sqrt{2} i \epsilon_{ijk} \bar{\psi} X_i Y_j \psi_k, \tag{43}$$

$$\epsilon^{ab} \bar{\psi}^c X_a{}^d Y_b{}^e Z_c{}^f T_{def} = \sqrt{2} i \epsilon_{ijk} \bar{\psi} X_i Y_j Z_l \tau_l \psi_k, \tag{44}$$

where $P(X, Y, Z)$ means all permutations for the symbols X, Y, and Z. O, O_i, X_i, Y_i and Z_i are building blocks in Ref. [22] or their products. The definitions of the symbols in the right-hand side can be found in Ref. [22].

Alternatively, we may transform the original formalism to the new one. To do that, we define transition isospin I^j through $\psi_j = I_j \phi$ with $\phi = (\Delta^{++}, \Delta^+, \Delta^0, \Delta^-)^T$. Similarly, we define $T_{abc} = W^i_{abc} \phi^i$. The matrix forms of I^j and the values of W^i_{abc} are easy to obtain from the definitions. We have two relations in connecting the original $\pi\Delta\Delta$ Lagrangians with the new ones,

$$(I_i^\dagger I_j)_x{}^y = \frac{1}{2} [W_x^{abc} (\tau_i \tau_j)_a{}^d W^y_{bcd} - W_x^{abc} (\tau_i)_a{}^d (\tau_j)_b{}^e W^y_{cde}], \tag{45}$$

$$(I_i^\dagger \tau_l I_j)_x{}^y = \frac{1}{2} [W_x^{abc} (\tau_i \tau_j)_a{}^d (\tau_l)_b{}^e W^y_{cde} - W_x^{abc} (\tau_i)_a{}^d (\tau_j)_b{}^e (\tau_l)_c{}^f W^y_{def}]. \tag{46}$$

For the special case $j = i$, one has

$$(I_i^\dagger I_i)_x{}^y = W_x^{abc} W^y_{abc}, \tag{47}$$

$$(I_i^\dagger \tau_l I_i)_x{}^y = W_x^{abc} (\tau_l)_a{}^d W^y_{bcd}. \tag{48}$$

To connect the original $\pi N\Delta$ Lagrangians with the new ones, we may use

$$(I_i)_x{}^y = \frac{1}{\sqrt{2}} \epsilon^{3ab} (\tau_i)_a{}^c W^y_{xbc}, \tag{49}$$

$$(\tau_i I_j)_x{}^y = \frac{1}{\sqrt{2}} \epsilon^{3ab} (\tau_i)_x{}^c (\tau_j)_a{}^d W^y_{bcd}. \tag{50}$$

Note $(\tau_i I_j)_x{}^y \neq \frac{1}{\sqrt{2}} \epsilon^{3ab} (\tau_i)_a{}^c (\tau_j)_x{}^d W^y_{bcd}$. Substituting these six equations into the right-hand sides of Eqs. (37)–(44), one may prove the equivalence of the two sets of relations by using the formula $\epsilon^{3ab} (\tau_i \tau_j)_a{}^c W^y_{xbc} = \epsilon^{3ab} (\tau_i)_a{}^c (\tau_j)_b{}^d W^y_{xcd}$.

V. RESULTS AND DISCUSSIONS

Following the same steps from Sec. IV C to Sec. IV E in Ref. [22], we obtain the chiral Lagrangians with decuplet baryons up to the order $\mathcal{O}(p^4)$ and list them below.

A. $\mathcal{O}(p^1)$ order

In the three-flavor case, the lowest order meson-decuplet-decuplet chiral Lagrangian is

$$\mathcal{L}^{(1)}_{\mathrm{MTT}} = \cdots + C_1^{(1)} \bar{T}^{abc\mu} u_a{}^{d\nu} \gamma_5 \gamma_\nu T_{bcd\mu}, \tag{51}$$

where $C_1^{(1)}$ is the low-energy constant at this order and the ellipsis represents the terms coming from the first part in Eq. (22). The lowest order meson-octet-decuplet chiral Lagrangian reads

$$\mathcal{L}^{(1)}_{\mathrm{MBT}} = D_1^{(1)} \epsilon^{abc} \bar{B}_a{}^d u_b{}^{e\mu} T_{cde\mu} + \mathrm{H.c.}. \tag{52}$$

In the two-flavor case, the lowest order $\pi\Delta\Delta$ chiral Lagrangian has the same form as Eq. (51),

$$\mathcal{L}^{(1)}_{\pi\Delta\Delta} = \cdots + e_1^{(1)} \bar{T}^{abc\mu} u_a{}^{d\nu} \gamma_5 \gamma_\nu T_{bcd\mu}. \tag{53}$$

The difference lies only in the allowed numbers for the indices a, b, c, and d. Similarly, the lowest order $\pi N\Delta$ chiral Lagrangian can be written as

$$\mathcal{L}^{(1)}_{\pi N\Delta} = f_1^{(1)} (\epsilon^{ab} \bar{\psi}^c u_a{}^{d\mu} T_{A,n,bcd\mu} + \mathrm{H.c.}). \tag{54}$$

We have confirmed the previous results in Ref. [22] with the newly constructed Lagrangians. With the relations in

the last section, we get the relations between these two kinds of LECs,

$$e_1^{(1)} = c_1^{(1)} = \frac{1}{2} g_1, \qquad f_1^{(1)} = \frac{1}{\sqrt{2}} g_{\pi N \Delta}. \tag{55}$$

B. $\mathcal{O}(p^2)$ order

The $\mathcal{O}(p^2)$ order meson-decuplet-decuplet chiral Lagrangian has the form

$$\mathcal{L}^{(2)}_{\mathrm{MTT}} = \sum_{n=1}^{13} C_n^{(2)} O_n^{(3,2)}, \tag{56}$$

where the operators $O_n^{(N_f=3,2)}$ are listed in Table III. The meson-octet-decuplet chiral Lagrangian at this order is

$$\begin{aligned}\mathcal{L}^{(2)}_{\mathrm{MBT}} =& D_1^{(2)}(\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu}\gamma_5\gamma_\mu T_{A,n,def\nu} + \mathrm{H.c.}) \\ &+ D_2^{(2)}(\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu}\gamma_5\gamma_\mu T_{A,n,cef\nu} + \mathrm{H.c.}) \\ &+ D_3^{(2)}(\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\gamma_5\gamma_\mu T_{A,n,cdf\nu} + \mathrm{H.c.}) \\ &+ D_4^{(2)}(\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\gamma_5\gamma_\nu T_{A,n,cdf\mu} + \mathrm{H.c.}) \\ &+ D_5^{(2)}(i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu}\gamma_5\gamma_\mu T_{A,n,cde\nu} + \mathrm{H.c.}).\end{aligned} \tag{57}$$

This result is consistent with that in Ref. [34].

The new form of the $\pi\Delta\Delta$ chiral Lagrangian at the $\mathcal{O}(p^2)$ order is

$$\mathcal{L}^{(2)}_{\pi\Delta\Delta} = \sum_{n=1}^{11} e_n^{(2)} O_n^{(2,2)}, \tag{58}$$

TABLE III. The order $\mathcal{O}(p^2)$ meson-decuplet-decuplet ($\pi\Delta\Delta$) chiral Lagrangians, and the relations between $\pi\Delta\Delta$ LECs here and those in Ref. [22].

$O_n^{(n_f,2)}$	$SU(2)$	$SU(3)$	$e_n^{(2)}$
$\bar{T}^{abc\mu} u_a{}^d{}_\mu u_b{}^{e\nu} T_{cde\nu}$	1	1	$-c_1^{(2)}/2 - c_2^{(2)}/2$
$\bar{T}^{abc\mu} u_a{}^{d\nu} u_b{}^e{}_\nu T_{cde\mu}$	2	2	$-c_3^{(2)}/2$
$\bar{T}^{abc\mu} u_a{}^d{}_\mu u_d{}^{e\nu} T_{bce\nu}$	3	3	$c_1^{(2)}/2 + c_4^{(2)}/2$
$\bar{T}^{abc\mu} u_a{}^{d\nu} u_d{}^e{}_\mu T_{bce\nu}$	4	4	$c_2^{(2)}/2 + c_4^{(2)}/2$
$\bar{T}^{abc\mu} u_a{}^{d\nu} u_d{}^e{}_\nu T_{bce\mu}$	5	5	$c_3^{(2)}/2 + c_5^{(2)}$
$\bar{T}^{abc\mu} u^{de}{}_\mu u_{ed}{}^\nu T_{abc\nu}$		6	
$\bar{T}^{abc\mu} u^{de\nu} u_{ed\nu} T_{abc\mu}$		7	
$\bar{T}^{abc\mu} u_a{}^{d\nu} u_b{}^{e\lambda} D_{\nu\lambda} T_{cde\mu}$	6	8	$-c_6^{(2)}/2$
$\bar{T}^{abc\mu} u_a{}^{d\nu} u_d{}^{e\lambda} D_{\nu\lambda} T_{bce\mu}$	7	9	$c_6^{(2)}/2 + c_7^{(2)}$
$\bar{T}^{abc\mu} u^{de\nu} u_{ed}{}^\lambda D_{\nu\lambda} T_{abc\mu}$		10	
$i\bar{T}^{abc\mu} f_{s,+\mu}{}^\nu T_{abc\nu}$	8		$c_8^{(2)}$
$i\bar{T}^{abc\mu} f_{+a}{}^d{}_\mu{}^\nu T_{bcd\nu}$	9	11	$c_9^{(2)}$
$\bar{T}^{abc\mu}\chi_{+,s} T_{abc\mu}$	10	12	$c_{10}^{(2)}$
$\bar{T}^{abc\mu}\chi_{+a}{}^d T_{bcd\mu}$	11	13	$c_{11}^{(2)}$

where the operators $O_n^{(N_f=2,2)}$ can also be found in Table III. The new form $\pi N\Delta$ chiral Lagrangian reads

$$\begin{aligned}\mathcal{L}^{(2)}_{\pi N\Delta} =& f_1^{(2)}(\epsilon^{ab}\bar{\psi}^c u_a{}^{d\mu} u_b{}^{e\nu}\gamma_5\gamma_\mu T_{A,n,cde\nu} + \mathrm{H.c.}) \\ &+ f_2^{(2)}(\epsilon^{ab}\bar{\psi}^c u_a{}^{d\mu} u_c{}^{e\nu}\gamma_5\gamma_\mu T_{A,n,bde\nu} + \mathrm{H.c.}) \\ &+ f_3^{(2)}(i\epsilon^{ab}\bar{\psi}^c f_{+a}{}^{d\mu\nu}\gamma_5\gamma_\mu T_{A,n,bcd\nu} + \mathrm{H.c.}).\end{aligned} \tag{59}$$

This result is consistent with the Lagrangian in Ref. [22]. We present the relations between these two kinds of $\pi\Delta\Delta$ LECs in the last column of Table III. The obtained relations for the $\pi N\Delta$ LECs are

$$f_1^{(2)} = -\frac{1}{\sqrt{2}} d_1^{(2)}, \tag{60}$$

$$f_2^{(2)} = \frac{1}{\sqrt{2}} d_1^{(2)} + \frac{1}{\sqrt{2}} d_2^{(2)}, \tag{61}$$

$$f_3^{(2)} = \frac{1}{\sqrt{2}} d_3^{(2)}. \tag{62}$$

C. $\mathcal{O}(p^3)$ and $\mathcal{O}(p^4)$ orders

We define the $\mathcal{O}(p^3)$ and $\mathcal{O}(p^4)$ chiral Lagrangians as

$$\mathcal{L}^{(m)}_{\mathrm{MTT}} = \sum_n C_n^{(m)} O_n^{(3,m)}, \tag{63}$$

$$\mathcal{L}^{(m)}_{\mathrm{MBT}} = \sum_n D_n^{(m)}(P_n^{(3,m)} + \mathrm{H.c.}), \tag{64}$$

$$\mathcal{L}^{(m)}_{\pi\Delta\Delta} = \sum_n e_n^{(m)} O_n^{(2,m)}, \tag{65}$$

$$\mathcal{L}^{(m)}_{\pi N\Delta} = \sum_n f_n^{(m)}(P_n^{(2,m)} + \mathrm{H.c.}), \tag{66}$$

where $m = 3$ or 4 denotes the chiral dimension, $C_n^{(m)}$, $D_n^{(m)}$, $e_n^{(m)}$, and $f_n^{(m)}$ are the LECs, and $O_n^{(N_f,m)}$ and $P_n^{(N_f,m)}$ are the independent chiral-invariant terms in the N_f-flavor case. The results are listed in the Appendix. At the $\mathcal{O}(p^3)$ order, the meson-decuplet-decuplet ($\pi\Delta\Delta$) Lagrangians are presented in Table IV. There are 55 (38) independent terms in the $SU(3)$ ($SU(2)$) case. The meson-octet-decuplet ($\pi N\Delta$) Lagrangians are given in Table VI. There are 67 (33) independent terms in the $SU(3)$ ($SU(2)$) case. At the $\mathcal{O}(p^4)$ order, the meson-decuplet-decuplet ($\pi\Delta\Delta$) Lagrangians are presented in Table V. There are 548 (318) independent terms in the $SU(3)$ ($SU(2)$) case. The meson-octet-decuplet ($\pi N\Delta$) Lagrangians are listed in Table VII. There are 611 (218) independent terms in the $SU(3)$ ($SU(2)$) case. Note that the z_n parameters should be different for the meson-octet-decuplet and $\pi N\Delta$ Lagrangians at the different orders, but we do not distinguish them explicitly in the results.

To merge the meson-octet-decuplet and the $\pi N\Delta$ results, similar to those for the meson-decuplet-decuplet and $\pi\Delta\Delta$, we write them in a unified form. We have changed the

$SU(2)$ results with $\epsilon^{ab}\bar{\psi}^c \to \epsilon^{dab}\bar{B}_d{}^c$ by setting $d = 3$ but $a, b, c = 1, 2$ as before. Now, one can get the $SU(2)$ results from corresponding terms in Table VI and Table VII with

$$\epsilon^{abc}\bar{B}_a{}^d \ldots \xrightarrow{N_f=2} \epsilon^{bc}\bar{\psi}^d \ldots. \tag{67}$$

Because the number of LECs in $\mathcal{O}(p^3)$ and $\mathcal{O}(p^4)$ Lagrangians is large and only several LECs will be involved in a study, we here do not give the LEC relations between the new and original results at high orders. Each form of Lagrangian can be chosen to study low-energy processes. One may use relations in Sec. IV C to determine LECs from another form terms, if necessary.

From the results, one can see that not only the total number of terms but also the numbers in each type of external source in the chiral Lagrangians with Δ are the same as those in Ref. [22]. The equality in number is a strict condition for consistency of Lagrangians in different forms. The violation of this condition means that the number of terms in either or both forms is not minimal. This check confirms our previous results.

VI. SUMMARY

In this paper, we construct the relativistic chiral Lagrangians with decuplet baryons and give a new form of the chiral Lagrangians with $\Delta(1232)$ to one loop. These chiral Lagrangians are for the meson-decuplet-decuplet, meson-octet-decuplet, $\pi\Delta\Delta$, and $\pi N\Delta$ interactions. The correspondence between the $\pi\Delta\Delta$ and $\pi N\Delta$ chiral Lagrangians in Ref. [22] and those in the present form can be obtained with the relations we get in Sec. IV C.

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Note added in proof.—After the manuscript was submitted, a work for the next-to-leading order relativistic chiral Lagrangian (Ref. [61]) appeared. The Lagrangians are consistent once the item (vi) below Eq. (46) of Ref. [22] is noted.

APPENDIX: INDEPENDENT TERMS IN $\mathcal{O}(p^3)$ AND $\mathcal{O}(p^4)$ CHIRAL LAGRANGIANS WITH DECUPLET BARYONS

TABLE IV. Terms in the $\mathcal{O}(p^3)$ meson-decuplet-decuplet and $\pi\Delta\Delta$ chiral Lagrangians, where $O_n^{(N_f,3)}$ is defined in Eqs. (63) and (65).

$O_n^{(N_f,3)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,3)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_c{}^{f\lambda}\gamma_5\gamma_\nu T_{def\lambda}$	1	1	$\bar{T}^{abc\mu}u_a{}^{d\nu}f_{-d}{}^e{}_\mu{}^\lambda D_\nu T_{bce\lambda}+\text{H.c.}$	15	30
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^{f\lambda}\gamma_5\gamma_\nu T_{cef\lambda}$	2	2	$\bar{T}^{abc\mu}u_a{}^{d\nu}f_{-d}{}^e{}_\mu{}^\lambda D_\lambda T_{bce\nu}+\text{H.c.}$	16	31
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^{f\lambda}\gamma_5\gamma_\lambda T_{cef\nu}+\text{H.c.}$	3	3	$\bar{T}^{abc\mu}u_a{}^{d\nu}f_{-d}{}^e{}_\nu{}^\lambda D_\lambda T_{bce\mu}+\text{H.c.}$	17	32
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_e{}^{f\lambda}\gamma_5\gamma_\lambda T_{cdf\nu}+\text{H.c.}$	4	4	$\bar{T}^{abc\mu}u^{de}{}_\mu f_{-ed}{}^{\nu\lambda}D_\nu T_{abc\lambda}+\text{H.c.}$		33
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_c{}^{f\lambda}\gamma_5\gamma_\lambda T_{def\mu}$	5	5	$\bar{T}^{abc\mu}u^{de\nu}f_{-ed\mu}{}^\lambda D_\nu T_{abc\lambda}$		34
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_d{}^{e\nu}u_e{}^{f\lambda}\gamma_5\gamma_\nu T_{bcf\lambda}$		6	$\bar{T}^{abc\mu}u_a{}^d{}_\mu h_d{}^{e\nu\lambda}D_\nu T_{bce\lambda}+\text{H.c.}$	18	35
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_d{}^{f\lambda}\gamma_5\gamma_\lambda T_{cef\mu}+\text{H.c.}$	6	7	$\bar{T}^{abc\mu}u_a{}^{d\nu}h_d{}^e{}_\nu{}^\lambda D_\lambda T_{bce\mu}+\text{H.c.}$	19	36
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\mu\gamma_5\gamma_\lambda T_{cef\nu}$	7	8	$\bar{T}^{abc\mu}u_a{}^{d\nu}h_d{}^{e\lambda\rho}D_{\nu\lambda\rho}T_{bce\mu}+\text{H.c.}$	20	37
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_d{}^{e\nu}u_e{}^{f\lambda}\gamma_5\gamma_\lambda T_{bcf\nu}+\text{H.c.}$		9	$\bar{T}^{abc\mu}\nabla^\nu f_{-a}{}^d{}_\nu{}^\lambda\gamma_5\gamma_\lambda T_{bcd\mu}$	21	38
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\nu\gamma_5\gamma_\lambda T_{cef\mu}$	8	10	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}\gamma_5\gamma_\nu T_{cde\lambda}+\text{H.c.}$	22	39
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u^{ef\nu}u_{fe}{}^\lambda\gamma_5\gamma_\nu T_{bcd\lambda}+\text{H.c.}$		11	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}\gamma_5\gamma_\lambda T_{cde\nu}$	23	40
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^e{}_\mu u_e{}^{f\lambda}\gamma_5\gamma_\lambda T_{bcf\nu}+\text{H.c.}$		12	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_d{}^{e\lambda}\gamma_5\gamma_\nu T_{bce\lambda}+\text{H.c.}$	24	41
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^e{}_\nu u_e{}^{f\lambda}\gamma_5\gamma_\lambda T_{bcf\mu}+\text{H.c.}$		13	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_d{}^{e\lambda}\gamma_5\gamma_\lambda T_{bce\nu}+\text{H.c.}$	25	42
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^f{}_\mu\gamma_5\gamma_\lambda T_{bcf\nu}$		14	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^e{}_\mu\gamma_5\gamma_\nu T_{bce\lambda}+\text{H.c.}$	26	43
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^f{}_\nu\gamma_5\gamma_\lambda T_{bcf\mu}$		15	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^e{}_\nu\gamma_5\gamma_\lambda T_{bce\mu}+\text{H.c.}$	27	44
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_\mu u_{fe}{}^\lambda\gamma_5\gamma_\nu T_{bcd\lambda}$		16	$i\bar{T}^{abc\mu}f_+{}^{de}{}_\mu{}^\nu u_{ed}{}^\lambda\gamma_5\gamma_\nu T_{abc\lambda}+\text{H.c.}$		45
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_\nu u_{fe}{}^\lambda\gamma_5\gamma_\lambda T_{bcd\mu}$		17	$i\bar{T}^{abc\mu}f_+{}^{de}{}_\mu{}^\nu u_{ed}{}^\lambda\gamma_5\gamma_\lambda T_{abc\nu}$		46

(Table continued)

TABLE IV. *(Continued)*

$O_n^{(N_f,3)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,3)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}u_{fe\lambda}\gamma_5\gamma_\nu T_{bcd\mu}$		18	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e\rho}\gamma_5\gamma_\nu D_{\lambda\rho}T_{bce\mu}+\text{H.c.}$	28	47
$\bar{T}^{abc\mu}u^{de}{}_\mu u_e{}^{f\nu}u_{fd}{}^\lambda\gamma_5\gamma_\nu T_{abc\lambda}$		19	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^\nu u_a{}^{d\lambda}\gamma_5\gamma_\nu T_{bcd\lambda}+\text{H.c.}$	29	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_c{}^{f\rho}\gamma_5\gamma_\nu D_{\lambda\rho}T_{def\mu}$	9	20	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^\nu u_a{}^{d\lambda}\gamma_5\gamma_\lambda T_{bcd\nu}$	30	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}\gamma_5\gamma_\nu D_{\lambda\rho}T_{cef\mu}+\text{H.c.}$	10	21	$i\bar{T}^{abc\mu}\nabla^\nu f_{+a}{}^d{}_\nu{}^\lambda D_\lambda T_{bcd\mu}$	31	48
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}\gamma_5\gamma_\lambda D_{\nu\rho}T_{cef\mu}$	11	22	$i\bar{T}^{abc\mu}\nabla^\nu f_{s,+\nu}{}^\lambda D_\lambda T_{abc\mu}$	32	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f\rho}\gamma_5\gamma_\nu D_{\lambda\rho}T_{bcf\mu}+\text{H.c.}$		23	$\bar{T}^{abc\mu}u_a{}^{d\nu}\chi_{+b}{}^e\gamma_5\gamma_\nu T_{cde\mu}$	33	49
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f\rho}\gamma_5\gamma_\lambda D_{\nu\rho}T_{bcf\mu}$		24	$\bar{T}^{abc\mu}u_a{}^{d\nu}\chi_{+d}{}^e\gamma_5\gamma_\nu T_{bce\mu}+\text{H.c.}$	34	50
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}u_{fe}{}^\rho\gamma_5\gamma_\nu D_{\lambda\rho}T_{bcd\mu}$		25	$\bar{T}^{abc\mu}u^{de\nu}\chi_{+ed}\gamma_5\gamma_\nu T_{abc\mu}$		51
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}u_{fe}{}^\rho\gamma_5\gamma_\lambda D_{\nu\rho}T_{bcd\mu}$		26	$\bar{T}^{abc\mu}u_a{}^{d\nu}\chi_{+,s}\gamma_5\gamma_\nu T_{bcd\mu}$	35	52
$\bar{T}^{abc\mu}u_a{}^d{}_\mu f_{-b}{}^{e\nu\lambda}D_\nu T_{cde\lambda}+\text{H.c.}$	12	27	$i\bar{T}^{abc\mu}u_a{}^{d\nu}\chi_{-d}{}^e D_\nu T_{bce\mu}+\text{H.c.}$	36	53
$\bar{T}^{abc\mu}u_a{}^{d\nu}f_{-b}{}^e{}_\mu{}^\lambda D_\nu T_{cde\lambda}$	13	28	$i\bar{T}^{abc\mu}\nabla^\nu\chi_{-a}{}^d\gamma_5\gamma_\nu T_{bcd\mu}$	37	54
$\bar{T}^{abc\mu}u_a{}^d{}_\mu f_{-d}{}^{e\nu\lambda}D_\nu T_{bce\lambda}+\text{H.c.}$	14	29	$i\bar{T}^{abc\mu}\nabla^\nu\chi_{-,s}\gamma_5\gamma_\nu T_{abc\mu}$	38	55

TABLE V. Terms in the $\mathcal{O}(p^4)$ meson-decuplet-decuplet and $\pi\Delta\Delta$ chiral Lagrangians, where $O_n^{(N_f,4)}$ is defined in Eqs. (63) and (65).

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_c{}^f{}_\nu u_d{}^{g\lambda}T_{efg\lambda}$	1	1	$\bar{T}^{abc\mu}h^{de\nu\lambda}h_{ed}{}^{\rho\sigma}D_{\nu\lambda\rho\sigma}T_{abc\mu}$		299
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_c{}^f{}_\nu u_e{}^{g\lambda}T_{dfg\lambda}+\text{H.c.}$	2	2	$i\bar{T}^{abc\mu}h_a{}^d{}_\mu{}^\nu h_d{}^{e\lambda\rho}\sigma_{\nu\lambda}T_{bce\rho}$	122	300
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_c{}^{f\lambda}u_e{}^g{}_\nu T_{dfg\lambda}$	3	3	$\bar{T}^{abc\mu}u_a{}^d{}_\mu\nabla^\nu f_{-b}{}^e{}_\nu{}^\lambda T_{cde\lambda}+\text{H.c.}$	123	301
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_c{}^{f\lambda}u_e{}^g{}_\lambda T_{dfg\nu}+\text{H.c.}$	4	4	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^\lambda f_{-b}{}^e{}_{\nu\lambda}T_{cde\mu}$	124	302
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^f{}_\nu u_e{}^{g\lambda}T_{cfg\lambda}$	5	5	$\bar{T}^{abc\mu}u_a{}^d{}_\mu\nabla^\nu f_{-d}{}^e{}_\nu{}^\lambda T_{bce\lambda}+\text{H.c.}$	125	303
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^g{}_\nu T_{cfg\lambda}$		6	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^\lambda f_{-d}{}^e{}_{\mu\lambda}T_{bce\nu}+\text{H.c.}$	126	304
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^f{}_\nu u_f{}^{g\lambda}T_{ceg\lambda}$		7	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^\lambda f_{-d}{}^e{}_{\nu\lambda}T_{bce\mu}+\text{H.c.}$	127	305
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^g{}_\lambda T_{cfg\nu}+\text{H.c.}$	6	8	$\bar{T}^{abc\mu}u^{de}{}_\mu\nabla^\nu f_{-ed\nu}{}^\lambda T_{abc\lambda}+\text{H.c.}$		306
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_d{}^{f\lambda}u_f{}^g{}_\nu T_{ceg\lambda}+\text{H.c.}$		9	$\bar{T}^{abc\mu}u^{de\nu}\nabla^\lambda f_{-ed\nu\lambda}T_{abc\mu}$		307
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_e{}^f{}_\nu u_f{}^{g\lambda}T_{cdg\lambda}+\text{H.c.}$		10	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^\lambda f_{-b}{}^e{}_\lambda{}^\rho D_{\nu\rho}T_{cde\mu}$	128	308
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_e{}^{f\lambda}u_f{}^g{}_\nu T_{cdg\lambda}+\text{H.c.}$		11	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^\lambda f_{-d}{}^e{}_\lambda{}^\rho D_{\nu\rho}T_{bce\mu}+\text{H.c.}$	129	309
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u_e{}^{f\lambda}u_f{}^g{}_\lambda T_{cdg\nu}+\text{H.c.}$		12	$\bar{T}^{abc\mu}u^{de\nu}\nabla^\lambda f_{-ed\lambda}{}^\rho D_{\nu\rho}T_{abc\mu}$		310
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u^{fg}{}_\nu u_{gf}{}^\lambda T_{cde\lambda}+\text{H.c.}$		13	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^e{}_\nu u_c{}^{f\lambda}T_{def\lambda}+\text{H.c.}$	130	311
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_c{}^{f\lambda}u_f{}^g{}_\mu T_{deg\lambda}$	7	14	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^e{}_\nu u_d{}^{f\lambda}T_{cef\lambda}+\text{H.c.}$	131	312
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_b{}^{e\nu}u^{fg\lambda}u_{gf\lambda}T_{cde\nu}$		15	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^e{}_\nu u_e{}^{f\lambda}T_{cdf\lambda}+\text{H.c.}$	132	313
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_c{}^{f\lambda}u_d{}^g{}_\lambda T_{efg\mu}$	8	16	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}u_c{}^f{}_\lambda T_{def\nu}$	133	314
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_c{}^{f\lambda}u_f{}^g{}_\lambda T_{deg\mu}$	9	17	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}u_d{}^f{}_\nu T_{cef\lambda}+\text{H.c.}$	134	315
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_d{}^{f\lambda}u_f{}^g{}_\mu T_{ceg\lambda}+\text{H.c.}$		18	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}u_d{}^f{}_\lambda T_{cef\nu}+\text{H.c.}$	135	316
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_d{}^{e\nu}u_e{}^f{}_\nu u_f{}^{g\lambda}T_{bcg\lambda}$		19	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}u_e{}^f{}_\nu T_{cdf\lambda}+\text{H.c.}$	136	317
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_d{}^{f\lambda}u_e{}^g{}_\lambda T_{cfg\mu}$	10	20	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_b{}^{e\lambda}u_e{}^f{}_\lambda T_{cdf\nu}$	137	318
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\mu u_e{}^g{}_\nu T_{cfg\lambda}$	11	21	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_d{}^e{}_\nu u_e{}^{f\lambda}T_{bcf\lambda}+\text{H.c.}$		319
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u_d{}^{f\lambda}u_f{}^g{}_\lambda T_{ceg\mu}+\text{H.c.}$		22	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^e{}_\mu u_d{}^f{}_\nu T_{cef\lambda}+\text{H.c.}$	138	320
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^g{}_\nu T_{bcg\lambda}+\text{H.c.}$		23	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_d{}^{e\lambda}u_e{}^f{}_\nu T_{bcf\lambda}+\text{H.c.}$		321
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\mu u_e{}^g{}_\lambda T_{cfg\nu}$		24	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u_d{}^{e\lambda}u_e{}^f{}_\lambda T_{bcf\nu}+\text{H.c.}$		322
$\bar{T}^{abc\mu}u_a{}^d{}_\mu u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^g{}_\lambda T_{bcg\nu}+\text{H.c.}$		25	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^e{}_\nu u_d{}^f{}_\mu T_{cef\lambda}+\text{H.c.}$	139	323
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^e{}_\nu u^{fg}{}_\mu u_{gf}{}^\lambda T_{cde\lambda}$		26	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^e{}_\nu u_d{}^f{}_\lambda T_{cef\mu}+\text{H.c.}$	140	324
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\nu u_e{}^g{}_\lambda T_{cfg\mu}$	12	27	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u^{ef}{}_\nu u_{fe}{}^\lambda T_{bcd\lambda}+\text{H.c.}$		325
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\lambda u_e{}^g{}_\nu T_{cfg\mu}$		28	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^e{}_\nu u_e{}^f{}_\lambda T_{cdf\mu}$	141	326
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\lambda u_f{}^g{}_\mu T_{ceg\nu}$		29	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^e{}_\mu u_e{}^f{}_\nu T_{bcf\lambda}+\text{H.c.}$		327
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^f{}_\lambda u_f{}^g{}_\nu T_{ceg\mu}$		30	$i\bar{T}^{abc\mu}f_{+a}{}^d{}_\mu{}^\nu u^{ef\lambda}u_{fe\lambda}T_{bcd\nu}$		328

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u^{fg\lambda}u_{gf\lambda}T_{cde\mu}$		31	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e}{}_{\nu}u_e{}^{f}{}_{\mu}T_{bcf\lambda}+\text{H.c.}$		329
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u_e{}^{f\lambda}u_f{}^{g}{}_{\nu}T_{bcg\lambda}$		32	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e}{}_{\nu}u_e{}^{f}{}_{\lambda}T_{bcf\mu}+\text{H.c.}$		330
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u_e{}^{f\lambda}u_f{}^{g}{}_{\lambda}T_{bcg\nu}+\text{H.c.}$		33	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad\nu}u_e{}^{f\lambda}T_{bcf\lambda}+\text{H.c.}$		331
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u^{fg}{}_{\nu}u_{gf}{}^{\lambda}T_{bce\lambda}+\text{H.c.}$		34	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f}{}_{\nu}T_{bcf\lambda}+\text{H.c.}$		332
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u^{fg}{}_{\nu}u_{gf\lambda}T_{cde\mu}$		35	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f}{}_{\lambda}T_{bcf\nu}$		333
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}u^{fg}{}_{\mu}u_{gf}{}^{\lambda}T_{bce\lambda}$		36	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f}{}_{\nu}u_{ed}{}^{\lambda}T_{bcf\lambda}+\text{H.c.}$		334
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u^{fg\lambda}u_{gf\lambda}T_{bce\nu}$		37	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed\nu}T_{bcf\lambda}+\text{H.c.}$		335
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}u_e{}^{f\lambda}u_f{}^{g}{}_{\lambda}T_{bcg\mu}$		38	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed\lambda}T_{bcf\nu}$		336
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f}{}_{\nu}u_f{}^{g}{}_{\lambda}T_{bcg\mu}$		39	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}u_{ad\nu}u_e{}^{f}{}_{\lambda}T_{bcf\mu}$		337
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}u^{fg\lambda}u_{gf\lambda}T_{bce\mu}$		40	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_e{}^{f}{}_{\nu}u_{fd}{}^{\lambda}T_{abc\lambda}+\text{H.c.}$		338
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}u_f{}^{g}{}_{\nu}u_{ge}{}^{\lambda}T_{bcd\lambda}$		41	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}u_e{}^{f}{}_{\nu}u_{fd\lambda}T_{abc\mu}$		339
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}u^{fg}{}_{\nu}u_{gf}{}^{\lambda}T_{abc\lambda}$		42	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_c{}^{f\rho}D_{\nu\lambda}T_{def\rho}+\text{H.c.}$	142	340
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}u^{fg\lambda}u_{gf\lambda}T_{abc\nu}$		43	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_c{}^{f\rho}D_{\lambda\rho}T_{def\nu}$	143	341
$\bar{T}^{abc\mu}u^{de\nu}u_{ed\nu}u^{fg\lambda}u_{gf\lambda}T_{abc\mu}$		44	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_d{}^{f\rho}D_{\nu\lambda}T_{cef\rho}+\text{H.c.}$	144	342
$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}u^{fg}{}_{\nu}u_{gf\lambda}T_{abc\mu}$		45	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_d{}^{f\rho}D_{\nu\rho}T_{cef\lambda}+\text{H.c.}$	145	343
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_d{}^{g\rho}D_{\nu\lambda}T_{efg\rho}$	13	46	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_d{}^{f\rho}D_{\lambda\rho}T_{cef\nu}+\text{H.c.}$	146	344
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_d{}^{g\rho}D_{\nu\rho}T_{efg\lambda}+\text{H.c.}$	14	47	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_e{}^{f\rho}D_{\nu\lambda}T_{cdf\rho}+\text{H.c.}$	147	345
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_e{}^{g\rho}D_{\nu\rho}T_{dfg\lambda}$	15	48	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_e{}^{f\rho}D_{\nu\rho}T_{cdf\lambda}+\text{H.c.}$	148	346
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_e{}^{g\rho}D_{\lambda\rho}T_{dfg\nu}+\text{H.c.}$	16	49	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_e{}^{f\rho}D_{\lambda\rho}T_{cdf\nu}$	149	347
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^{g\rho}D_{\nu\lambda}T_{cfg\rho}$	17	50	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_d{}^{e\lambda}u_e{}^{f\rho}D_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		348
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^{g\rho}D_{\nu\rho}T_{cfg\lambda}$		51	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_d{}^{e\lambda}u_e{}^{f\rho}D_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		349
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^{g\rho}D_{\lambda\rho}T_{cfg\nu}+\text{H.c.}$	18	52	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_d{}^{e\lambda}u_e{}^{f\rho}D_{\lambda\rho}T_{bcf\nu}+\text{H.c.}$		350
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_f{}^{g\rho}D_{\nu\lambda}T_{ceg\rho}$		53	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^{e}{}_{\mu}u_d{}^{f\rho}D_{\nu\rho}T_{cef\lambda}+\text{H.c.}$	150	351
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{ceg\lambda}+\text{H.c.}$		54	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^{e}{}_{\nu}u_d{}^{f\rho}D_{\lambda\rho}T_{cef\mu}+\text{H.c.}$	151	352
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{ceg\nu}+\text{H.c.}$		55	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^{e}{}_{\nu}u_e{}^{f\rho}D_{\lambda\rho}T_{cdf\mu}+\text{H.c.}$	152	353
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{cdg\lambda}+\text{H.c.}$		56	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^{e\rho}u_d{}^{f}{}_{\mu}D_{\nu\rho}T_{cef\lambda}+\text{H.c.}$	153	354
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{cdg\nu}+\text{H.c.}$		57	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u^{ef\lambda}u_{fe}{}^{\rho}D_{\nu\lambda}T_{bcd\rho}+\text{H.c.}$		355
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\nu\lambda}T_{cde\rho}+\text{H.c.}$		58	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u^{ef\lambda}u_{fe}{}^{\rho}D_{\lambda\rho}T_{bcd\nu}$		356
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{cde\nu}$		59	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_b{}^{e\rho}u_d{}^{f}{}_{\nu}D_{\lambda\rho}T_{cef\mu}+\text{H.c.}$	154	357
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u_c{}^{f\lambda}u_d{}^{g\rho}D_{\lambda\rho}T_{efg\mu}+\text{H.c.}$	19	60	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e}{}_{\mu}u_e{}^{f\rho}D_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		358
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u_c{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{deg\mu}$	20	61	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e}{}_{\nu}u_e{}^{f\rho}D_{\lambda\rho}T_{bcf\mu}+\text{H.c.}$		359
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\nu\lambda}T_{bcg\rho}$		62	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e\rho}u_e{}^{f}{}_{\mu}D_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		360
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{bcg\lambda}+\text{H.c.}$		63	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}u_d{}^{e\rho}u_e{}^{f}{}_{\nu}D_{\lambda\rho}T_{bcf\mu}+\text{H.c.}$		361
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{bcg\nu}+\text{H.c.}$		64	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f\rho}D_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		362
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u_d{}^{f\lambda}u_e{}^{g\rho}D_{\lambda\rho}T_{cfg\mu}+\text{H.c.}$	21	65	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f\rho}D_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		363
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u_d{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{ceg\mu}+\text{H.c.}$		66	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f\rho}D_{\lambda\rho}T_{bcf\nu}$		364
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\mu}u_e{}^{g\rho}D_{\nu\rho}T_{cfg\lambda}$	22	67	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed}{}^{\rho}D_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		365
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\mu}u_e{}^{g\rho}D_{\lambda\rho}T_{cfg\nu}$	23	68	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed}{}^{\rho}D_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		366
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\mu}u_f{}^{g\rho}D_{\lambda\rho}T_{ceg\nu}+\text{H.c.}$		69	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed}{}^{\rho}D_{\lambda\rho}T_{bcf\nu}$		367
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_c{}^{f\rho}u_d{}^{g}{}_{\mu}D_{\lambda\rho}T_{efg\nu}$		70	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}u_{ad\nu}u_e{}^{f\rho}D_{\lambda\rho}T_{bcf\mu}+\text{H.c.}$		368
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_c{}^{f\rho}u_d{}^{g}{}_{\nu}D_{\lambda\rho}T_{efg\mu}$	24	71	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_e{}^{f\lambda}u_{fd}{}^{\rho}D_{\nu\lambda}T_{abc\rho}+\text{H.c.}$		369
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\nu}u_e{}^{g\rho}D_{\lambda\rho}T_{cfg\mu}$	25	72	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}u_e{}^{f}{}_{\nu}u_{fd}{}^{\rho}D_{\lambda\rho}T_{abc\mu}+\text{H.c.}$		370
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\nu}u_f{}^{g\rho}D_{\lambda\rho}T_{ceg\mu}+\text{H.c.}$		73	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_c{}^{f\rho}\sigma_{\nu\lambda}T_{def\rho}+\text{H.c.}$	155	371
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\lambda}u_e{}^{g\rho}D_{\nu\rho}T_{cfg\mu}$		74	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_d{}^{f\rho}\sigma_{\nu\lambda}T_{cef\rho}+\text{H.c.}$	156	372
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{cde\mu}$		75	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_d{}^{f\rho}\sigma_{\nu\rho}T_{cef\lambda}+\text{H.c.}$	157	373
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{ceg\mu}$		76	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_e{}^{f\rho}\sigma_{\nu\lambda}T_{cdf\rho}+\text{H.c.}$	158	374
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}u_f{}^{g}{}_{\mu}D_{\lambda\rho}T_{ceg\nu}$		77	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_b{}^{e\lambda}u_e{}^{f\rho}\sigma_{\nu\rho}T_{cdf\lambda}+\text{H.c.}$	159	375

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}u_f{}^{g}{}_{\nu}D_{\lambda\rho}T_{ceg\mu}$		78	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d}{}_{\nu}u_b{}^{e\lambda}T_{cde\lambda}+\text{H.c.}$	160	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{bcg\lambda}$		79	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_b{}^{e}{}_{\lambda}T_{cde\nu}$	161	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{bcg\nu}+\text{H.c.}$		80	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d}{}_{\nu}u_d{}^{e\lambda}T_{bce\lambda}+\text{H.c.}$	162	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u^{fg}{}_{\mu}u_{gf}{}^{\rho}D_{\nu\lambda}T_{cde\rho}$		81	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e}{}_{\nu}T_{bce\lambda}+\text{H.c.}$	163	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u^{fg}{}_{\nu}u_{gf}{}^{\rho}D_{\lambda\rho}T_{cde\mu}$		82	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e}{}_{\lambda}T_{bce\nu}$	164	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\nu\lambda}T_{bce\rho}+\text{H.c.}$		83	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}T_{bce\mu}$	165	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{bce\nu}$		84	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_b{}^{e\rho}D_{\nu\lambda}T_{cde\rho}+\text{H.c.}$	166	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}u_e{}^{f\lambda}u_f{}^{g\rho}D_{\lambda\rho}T_{bcg\mu}+\text{H.c.}$		85	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_b{}^{e\rho}D_{\lambda\rho}T_{cde\nu}$	167	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f}{}_{\mu}u_f{}^{g\rho}D_{\nu\rho}T_{bcg\lambda}$		86	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e\rho}D_{\nu\lambda}T_{bce\rho}+\text{H.c.}$	168	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u^{fg\rho}u_{gf\rho}D_{\nu\lambda}T_{cde\mu}$		87	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e\rho}D_{\nu\rho}T_{bce\lambda}+\text{H.c.}$	169	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{bce\mu}$		88	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e\rho}D_{\lambda\rho}T_{bce\nu}$	170	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f}{}_{\nu}u_f{}^{g\rho}D_{\lambda\rho}T_{bcg\mu}+\text{H.c.}$		89	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}u_a{}^{d}{}_{\nu}u_d{}^{e\rho}D_{\lambda\rho}T_{bce\mu}+\text{H.c.}$	171	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f}{}_{\lambda}u_f{}^{g\rho}D_{\nu\rho}T_{bcg\mu}$		90	$\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_b{}^{e\rho}\sigma_{\nu\lambda}T_{cde\rho}+\text{H.c.}$	172	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}u_f{}^{g\lambda}u_{ge}{}^{\rho}D_{\nu\lambda}T_{bcd\rho}$		91	$\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e\rho}\sigma_{\nu\lambda}T_{bce\rho}+\text{H.c.}$	173	
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\nu\lambda}T_{abc\rho}$		92	$\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}u_a{}^{d\lambda}u_d{}^{e\rho}\sigma_{\nu\rho}T_{bce\lambda}+\text{H.c.}$	174	
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{abc\nu}$		93	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_d{}^{e\lambda}u_e{}^{f\rho}\sigma_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		376
$\bar{T}^{abc\mu}u^{de\nu}u_{ed\nu}u^{fg\lambda}u_{gf}{}^{\rho}D_{\lambda\rho}T_{abc\mu}$		94	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u_d{}^{e\lambda}u_e{}^{f\rho}\sigma_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		377
$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}u^{fg}{}_{\nu}u_{gf}{}^{\rho}D_{\lambda\rho}T_{abc\mu}$		95	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}u^{ef\lambda}u_{fe}{}^{\rho}\sigma_{\nu\lambda}T_{bcd\rho}+\text{H.c.}$		378
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_c{}^{f\rho}u_d{}^{g\sigma}D_{\nu\lambda\rho\sigma}T_{efg\mu}$	26	96	$\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f\rho}\sigma_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		379
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}u_e{}^{g\sigma}D_{\nu\lambda\rho\sigma}T_{cfg\mu}$	27	97	$\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_{ad}{}^{\lambda}u_e{}^{f\rho}\sigma_{\nu\rho}T_{bcf\lambda}+\text{H.c.}$		380
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f\rho}u_f{}^{g\sigma}D_{\nu\lambda\rho\sigma}T_{ceg\mu}$		98	$\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_a{}^{f\lambda}u_{ed}{}^{\rho}\sigma_{\nu\lambda}T_{bcf\rho}+\text{H.c.}$		381
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u^{fg\rho}u_{gf}{}^{\sigma}D_{\nu\lambda\rho\sigma}T_{cde\mu}$		99	$\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}u_e{}^{f\lambda}u_{fd}{}^{\rho}\sigma_{\nu\lambda}T_{abc\rho}+\text{H.c.}$		382
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}u_e{}^{f\rho}u_f{}^{g\sigma}D_{\nu\lambda\rho\sigma}T_{bcg\mu}$		100	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{-b}{}^{e\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cde\rho}+\text{H.c.}$	175	383
$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}u^{fg\rho}u_{gf}{}^{\sigma}D_{\nu\lambda\rho\sigma}T_{abc\mu}$		101	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{-b}{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cde\rho}+\text{H.c.}$	176	384
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_d{}^{g\rho}\sigma_{\nu\rho}T_{efg\lambda}+\text{H.c.}$	28	102	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-b}{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cde\mu}$	177	385
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_c{}^{f\lambda}u_e{}^{g\rho}\sigma_{\nu\rho}T_{dfg\lambda}$	29	103	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-b}{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cde\mu}$	178	386
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^{g\rho}\sigma_{\nu\lambda}T_{cfg\rho}$	30	104	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{-d}{}^{e\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bce\rho}+\text{H.c.}$	179	387
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_e{}^{g\rho}\sigma_{\nu\rho}T_{cfg\lambda}$		105	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{-d}{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bce\rho}+\text{H.c.}$	180	388
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_d{}^{f\lambda}u_f{}^{g\rho}\sigma_{\nu\rho}T_{ceg\lambda}+\text{H.c.}$		106	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{-d}{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bce\nu}+\text{H.c.}$	181	389
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}\sigma_{\nu\rho}T_{cdg\lambda}+\text{H.c.}$		107	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bce\rho}+\text{H.c.}$	182	390
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}u^{fg\lambda}u_{gf}{}^{\rho}\sigma_{\nu\lambda}T_{cde\rho}+\text{H.c.}$		108	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{bce\lambda}+\text{H.c.}$	183	391
$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}u_d{}^{f}{}_{\mu}u_e{}^{g\rho}\sigma_{\nu\rho}T_{cfg\lambda}$	31	109	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{bce\lambda}+\text{H.c.}$	184	392
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}\sigma_{\nu\lambda}T_{bcg\rho}$		110	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bce\mu}+\text{H.c.}$	185	393
$i\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}u_e{}^{f\lambda}u_f{}^{g\rho}\sigma_{\nu\rho}T_{bcg\lambda}+\text{H.c.}$		111	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bce\mu}+\text{H.c.}$	186	394
$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u_e{}^{f\lambda}u_f{}^{g\rho}\sigma_{\nu\rho}T_{bcg\lambda}$		112	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}f_{-a}{}^{d\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$	187	
$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}u^{fg\lambda}u_{gf}{}^{\rho}\sigma_{\nu\lambda}T_{bce\rho}+\text{H.c.}$		113	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}f_{-a}{}^{d\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcd\rho}+\text{H.c.}$	188	
$i\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}u^{fg\lambda}u_{gf}{}^{\rho}\sigma_{\nu\lambda}T_{abc\rho}$		114	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}f_{-a}{}^{d}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcd\mu}$	189	
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-c}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{def\rho}+\text{H.c.}$	32	115	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}f_{-a}{}^{d}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcd\mu}$	190	
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-c}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{def\rho}+\text{H.c.}$	33	116	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}f_{-ed}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{abc\rho}+\text{H.c.}$		395
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-d}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	34	117	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}f_{-ed}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{abc\rho}+\text{H.c.}$		396
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	35	118	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}f_{-ed\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}$		397
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\nu}+\text{H.c.}$	36	119	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}f_{-ed\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{abc\mu}$		398
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cdf\rho}+\text{H.c.}$	37	120	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}h_b{}^{e\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cde\rho}+\text{H.c.}$	191	399
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cdf\rho}+\text{H.c.}$	38	121	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}h_b{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cde\rho}+\text{H.c.}$	192	400
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cdf\nu}+\text{H.c.}$	39	122	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_b{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{cde\rho}$	193	401
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}f_{-b}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	40	123	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_b{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cde\mu}$	194	402
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}f_{-b}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	41	124	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_b{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cde\mu}$	195	403
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-c}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{def\rho}$	42	125	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}h_d{}^{e\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bce\rho}+\text{H.c.}$	196	404

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		126	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}h_d{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bce\rho}+\text{H.c.}$	197	405
$\bar{T}^{abc\nu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		127	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}h_d{}^{e\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bce\nu}+\text{H.c.}$	198	406
$\bar{T}^{abc\nu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		128	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_d{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bce\rho}+\text{H.c.}$	199	407
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	43	129	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_d{}^{e}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{bce\lambda}+\text{H.c.}$	200	408
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{cef\lambda}+\text{H.c.}$	44	130	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_d{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bce\mu}+\text{H.c.}$	201	409
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}f_{-b}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	45	131	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_d{}^{e}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bce\mu}+\text{H.c.}$	202	410
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}f_{-d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\mu}+\text{H.c.}$	46	132	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}h_{ed}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{abc\rho}+\text{H.c.}$		411
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-be}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cdf\rho}+\text{H.c.}$	47	133	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}h_{ed}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{abc\rho}+\text{H.c.}$		412
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	48	134	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}h_{ed\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{abc\rho}$		413
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\nu}+\text{H.c.}$	49	135	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}h_{ed\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}$		414
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}f_{-b}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	50	136	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}h_{ed\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{abc\mu}$		415
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cef\nu}+\text{H.c.}$	51	137	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_b{}^{e\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{cde\mu}$	203	416
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\mu}+\text{H.c.}$	52	138	$i\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}h_d{}^{e\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{bce\mu}+\text{H.c.}$	204	417
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-de}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		139	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}h_a{}^{d\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$	205	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cef\mu}+\text{H.c.}$	53	140	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}h_a{}^{d\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcd\rho}+\text{H.c.}$	206	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{cef\mu}+\text{H.c.}$	54	141	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}h_a{}^{d}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}$	207	
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-de}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		142	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}h_a{}^{d}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcd\mu}$	208	
$\bar{T}^{abc\nu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-b}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	55	143	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}h_a{}^{d}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcd\mu}$	209	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		144	$i\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}h_a{}^{d\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{bcd\mu}$	210	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}f_{-d}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{cef\mu}+\text{H.c.}$	56	145	$i\bar{T}^{abc\mu}f_{+}{}^{de\nu\lambda}h_{ed}{}^{\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{abc\mu}$		418
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-fe}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$		146	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+a}{}^{d}{}_{\nu}{}^{\lambda}u_b{}^{e\rho}\gamma_5\gamma_\lambda D_\rho T_{cde\mu}$	211	419
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-fe}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcd\rho}+\text{H.c.}$		147	$i\bar{T}^{abc\nu}\nabla^{\nu}f_{+a}{}^{d}{}_{\nu}{}^{\lambda}u_b{}^{e\rho}\gamma_5\gamma_\rho D_\lambda T_{cde\mu}$	212	420
$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u^{ef\nu}f_{-fe}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcd\nu}+\text{H.c.}$		148	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+a}{}^{d\lambda\rho}u_b{}^{e}{}_{\nu}\gamma_5\gamma_\lambda D_\rho T_{cde\mu}$	213	421
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		149	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+a}{}^{d}{}_{\nu}{}^{\lambda}u_d{}^{e\rho}\gamma_5\gamma_\lambda D_\rho T_{bce\mu}+\text{H.c.}$	214	422
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		150	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+a}{}^{d}{}_{\nu}{}^{\lambda}u_d{}^{e\rho}\gamma_5\gamma_\rho D_\lambda T_{bce\mu}+\text{H.c.}$	215	423
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-b}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\mu}+\text{H.c.}$	57	151	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+a}{}^{d\lambda\rho}u_d{}^{e}{}_{\nu}\gamma_5\gamma_\lambda D_\rho T_{bce\mu}+\text{H.c.}$	216	424
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-b}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cef\mu}+\text{H.c.}$	58	152	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{s,+\nu}{}^{\lambda}u_a{}^{d\rho}\gamma_5\gamma_\lambda D_\rho T_{bcd\mu}$	217	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}f_{-de}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		153	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{s,+\nu}{}^{\lambda}u_a{}^{d\rho}\gamma_5\gamma_\rho D_\lambda T_{bcd\mu}$	218	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		154	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{s,+}{}^{\lambda\rho}u_a{}^{d}{}_{\nu}\gamma_5\gamma_\lambda D_\rho T_{bcd\mu}$	219	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{bcf\lambda}+\text{H.c.}$		155	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+}{}^{de}{}_{\nu}{}^{\lambda}u_{ed}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}$		425
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\mu}+\text{H.c.}$		156	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+}{}^{de}{}_{\nu}{}^{\lambda}u_{ed}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{abc\mu}$		426
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		157	$i\bar{T}^{abc\mu}\nabla^{\nu}f_{+}{}^{de\lambda\rho}u_{ed\nu}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}$		427
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		158	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+a}{}^{d}{}_{\mu\sigma}f_{-b}{}^{e}{}_{\nu\lambda}T_{cde\rho}+\text{H.c.}$	220	428
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}f_{-de}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		159	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+a}{}^{d}{}_{\mu\sigma}f_{-d}{}^{e}{}_{\nu\lambda}T_{bce\rho}+\text{H.c.}$	221	429
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{bcf\lambda}+\text{H.c.}$		160	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+a}{}^{d}{}_{\mu\nu}f_{-d}{}^{e}{}_{\lambda\sigma}T_{bce\rho}+\text{H.c.}$	222	430
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcf\nu}+\text{H.c.}$		161	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}f_{+a}{}^{d}{}_{\nu}{}^{\sigma}f_{-d}{}^{e}{}_{\lambda\sigma}T_{bce\rho}+\text{H.c.}$	223	431
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\mu}+\text{H.c.}$		162	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{s,+\mu\sigma}f_{-a}{}^{d}{}_{\nu\lambda}T_{bcd\rho}+\text{H.c.}$	224	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}f_{-fe}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$		163	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+}{}^{de}{}_{\mu\sigma}f_{-ed\nu\lambda}T_{abc\rho}+\text{H.c.}$		432
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcf\mu}+\text{H.c.}$		164	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+a}{}^{d}{}_{\mu\nu}h_b{}^{e}{}_{\lambda\sigma}T_{cde\rho}+\text{H.c.}$	225	433
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{bcf\mu}+\text{H.c.}$		165	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+a}{}^{d}{}_{\mu\nu}h_d{}^{e}{}_{\lambda\sigma}T_{bce\rho}+\text{H.c.}$	226	434
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef}{}_{\mu}f_{-fe}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcd\rho}+\text{H.c.}$		166	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}f_{+a}{}^{d}{}_{\nu}{}^{\sigma}h_d{}^{e}{}_{\lambda\sigma}T_{bce\rho}+\text{H.c.}$	227	435
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}f_{-e}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{bcf\mu}+\text{H.c.}$		167	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{s,+\mu\nu}h_a{}^{d}{}_{\lambda\sigma}T_{bcd\rho}+\text{H.c.}$	228	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}f_{-de\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		168	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc\sigma}f_{+}{}^{de}{}_{\mu\nu}h_{ed\lambda\sigma}T_{abc\rho}+\text{H.c.}$		436
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}f_{-de\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\mu}+\text{H.c.}$		169	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}\nabla^{\sigma}f_{+a}{}^{d}{}_{\nu\sigma}u_b{}^{e}{}_{\lambda}T_{cde\rho}$	229	437
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}f_{-de\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcf\mu}+\text{H.c.}$		170	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}\nabla^{\sigma}f_{+a}{}^{d}{}_{\nu\sigma}u_d{}^{e}{}_{\lambda}T_{bce\rho}+\text{H.c.}$	230	438
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}f_{-fe\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}$		171	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}\nabla^{\sigma}f_{s,+\nu\sigma}u_a{}^{d}{}_{\lambda}T_{bcd\rho}$	231	
$\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}f_{-fe\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\nu T_{bcd\rho}$		172	$i\varepsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}\nabla^{\sigma}f_{+}{}^{de}{}_{\nu\sigma}u_{ed\lambda}T_{abc\rho}$		439
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}f_{-a}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		173	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+b}{}^{e}{}_{\nu}{}^{\lambda}T_{cde\lambda}$	232	440

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}f_{-a}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		174	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+b}{}^{e}{}_{\nu\lambda}T_{cde\mu}$	233	441
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u^{f}{}_{d}{}^{\nu}f_{-ef}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{abc\rho}+\text{H.c.}$		175	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+d}{}^{e}{}_{\nu}{}^{\lambda}T_{bce\lambda}$	234	442
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u^{f}{}_{d}{}^{\nu}f_{-ef}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{abc\rho}+\text{H.c.}$		176	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+d}{}^{e}{}_{\mu\nu}T_{bce\lambda}$		443
$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}f_{-a}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}$		177	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+d}{}^{e}{}_{\nu\lambda}T_{bce\mu}$		444
$\bar{T}^{abc\mu}u^{de\nu}u_{e}{}^{f\lambda}f_{-fd\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}+\text{H.c.}$		178	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+b}{}^{e\lambda\rho}D_{\nu\lambda}T_{cde\rho}$	235	445
$\bar{T}^{abc\mu}u^{de\nu}u_{e}{}^{f\lambda}f_{-fd\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{abc\mu}+\text{H.c.}$		179	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+b}{}^{e}{}_{\nu}{}^{\rho}D_{\lambda\rho}T_{cde\mu}$	236	446
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}f_{-d}{}^{f\rho\sigma}\gamma_5\gamma_\rho D_{\nu\lambda\sigma}T_{cef\mu}+\text{H.c.}$	59	180	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+d}{}^{e\lambda\rho}D_{\nu\lambda}T_{bce\rho}$	237	447
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}f_{-e}{}^{f\rho\sigma}\gamma_5\gamma_\rho D_{\nu\lambda\sigma}T_{bcf\mu}+\text{H.c.}$		181	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+d}{}^{e}{}_{\mu}{}^{\rho}D_{\nu\rho}T_{bce\lambda}$		448
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{c}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{def\rho}+\text{H.c.}$	60	182	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{+d}{}^{e}{}_{\nu}{}^{\rho}D_{\lambda\rho}T_{bce\mu}$		449
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{d}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cef\rho}+\text{H.c.}$	61	183	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+b}{}^{e\lambda\rho}\sigma_{\nu\lambda}T_{cde\rho}$	238	450
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	62	184	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{+d}{}^{e\lambda\rho}\sigma_{\nu\lambda}T_{bce\rho}$	239	451
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\nu}+\text{H.c.}$	63	185	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{s,+\nu}{}^{\lambda}T_{bcd\lambda}+\text{H.c.}$	240	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{cdf\rho}+\text{H.c.}$	64	186	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{s,+\nu\lambda}T_{bcd\mu}$	241	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cdf\rho}+\text{H.c.}$	65	187	$\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{s,+}{}^{\lambda\rho}D_{\nu\lambda}T_{bcd\rho}+\text{H.c.}$	242	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cdf\nu}+\text{H.c.}$	66	188	$\bar{T}^{abc\mu}f_{+a}{}^{d\nu\lambda}f_{s,+\nu}{}^{\rho}D_{\lambda\rho}T_{bcd\mu}$	243	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}h_{b}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{cef\rho}+\text{H.c.}$	67	189	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}f_{s,+}{}^{\lambda\rho}\sigma_{\nu\lambda}T_{bcd\rho}+\text{H.c.}$	244	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		190	$\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}f_{s,+\nu}{}^{\lambda}T_{abc\lambda}$	245	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		191	$\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}f_{s,+\nu\lambda}T_{abc\mu}$	246	
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		192	$\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}f_{s,+}{}^{\lambda\rho}D_{\nu\lambda}T_{abc\rho}$	247	
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{cef\lambda}+\text{H.c.}$	68	193	$\bar{T}^{abc\mu}f_{s,+}{}^{\nu\lambda}f_{s,+\nu}{}^{\rho}D_{\lambda\rho}T_{abc\mu}$	248	
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e}{}_{\nu}h_{d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\mu}+\text{H.c.}$	69	194	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}f_{s,+}{}^{\lambda\rho}\sigma_{\nu\lambda}T_{abc\rho}$	249	
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\nu}+\text{H.c.}$	70	195	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}f_{+ed}{}^{\lambda\rho}\sigma_{\nu\lambda}T_{abc\rho}$		452
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{cef\mu}+\text{H.c.}$	71	196	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}\chi_{+c}{}^{f}T_{def\nu}$	250	453
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}h_{de}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		197	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e}{}_{\nu}\chi_{+c}{}^{f}T_{def\mu}$	251	454
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cef\mu}+\text{H.c.}$	72	198	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}\chi_{+d}{}^{f}T_{cef\nu}+\text{H.c.}$	252	455
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{cef\mu}+\text{H.c.}$	73	199	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{b}{}^{e\nu}\chi_{+e}{}^{f}T_{cdf\nu}+\text{H.c.}$	253	456
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}h_{de}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		200	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e}{}_{\nu}\chi_{+d}{}^{f}T_{cef\mu}+\text{H.c.}$	254	457
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{cef\mu}+\text{H.c.}$	74	201	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}\chi_{+b}{}^{f}T_{cef\nu}$	255	458
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}h_{fe}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$		202	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\mu}\chi_{+b}{}^{f}T_{cef\nu}$	256	459
$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}h_{fe}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcd\nu}+\text{H.c.}$		203	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\nu}\chi_{+b}{}^{f}T_{cef\mu}$	257	460
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\mu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{bcf\rho}+\text{H.c.}$		204	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u_{d}{}^{e\nu}\chi_{+e}{}^{f}T_{bcf\nu}+\text{H.c.}$		461
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\mu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		205	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\mu}\chi_{+e}{}^{f}T_{bcf\nu}+\text{H.c.}$		462
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{b}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{cef\mu}+\text{H.c.}$	75	206	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\nu}\chi_{+e}{}^{f}T_{bcf\mu}+\text{H.c.}$		463
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef}{}_{\mu}h_{de}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcf\rho}+\text{H.c.}$		207	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}\chi_{+de}T_{bcf\nu}$		464
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e}{}_{\nu}h_{e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\mu}+\text{H.c.}$		208	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef}{}_{\mu}\chi_{+de}T_{bcf\nu}$		465
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{e}{}^{f}{}_{\mu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\nu}+\text{H.c.}$		209	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef}{}_{\nu}\chi_{+de}T_{bcf\mu}$		466
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{e}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{bcf\mu}+\text{H.c.}$		210	$\bar{T}^{abc\mu}u_{a}{}^{d}{}_{\mu}u^{ef\nu}\chi_{+fe}T_{bcd\nu}+\text{H.c.}$		467
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef}{}_{\mu}h_{fe}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{bcd\rho}+\text{H.c.}$		211	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef}{}_{\nu}\chi_{+fe}T_{bcd\mu}$		468
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{e}{}^{f}{}_{\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcf\mu}+\text{H.c.}$		212	$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}\chi_{+a}{}^{f}T_{bcf\nu}$		469
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{e}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\nu D_\rho T_{bcf\mu}+\text{H.c.}$		213	$\bar{T}^{abc\mu}u^{de\nu}u_{ed\nu}\chi_{+a}{}^{f}T_{bcf\mu}$		470
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}h_{e}{}^{f}{}_{\lambda}{}^{\rho}\gamma_5\gamma_\rho D_\nu T_{bcf\mu}+\text{H.c.}$		214	$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{e}{}^{f\nu}\chi_{+fd}T_{abc\nu}$		471
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef\lambda}h_{de\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{bcf\mu}+\text{H.c.}$		215	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}\chi_{+c}{}^{f}D_{\nu\lambda}T_{def\mu}$	258	472
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u^{f}{}_{d}{}^{\nu}h_{ef}{}^{\lambda\rho}\gamma_5\gamma_\nu D_\lambda T_{abc\rho}+\text{H.c.}$		216	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}\chi_{+d}{}^{f}D_{\nu\lambda}T_{cef\mu}+\text{H.c.}$	259	473
$\bar{T}^{abc\mu}u^{de}{}_{\mu}u^{f}{}_{d}{}^{\nu}h_{ef}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_\nu T_{abc\rho}+\text{H.c.}$		217	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}\chi_{+b}{}^{f}D_{\nu\lambda}T_{cef\mu}$	260	474
$\bar{T}^{abc\mu}u^{de\nu}u_{e}{}^{f\lambda}h_{fd\nu}{}^{\rho}\gamma_5\gamma_\lambda D_\rho T_{abc\mu}+\text{H.c.}$		218	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{d}{}^{e\lambda}\chi_{+e}{}^{f}D_{\nu\lambda}T_{bcf\mu}+\text{H.c.}$		475
$\bar{T}^{abc\mu}u^{de\nu}u_{e}{}^{f\lambda}h_{fd\nu}{}^{\rho}\gamma_5\gamma_\rho D_\lambda T_{abc\mu}+\text{H.c.}$		219	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef\lambda}\chi_{+de}D_{\nu\lambda}T_{bcf\mu}$		476
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{cef\mu}+\text{H.c.}$	76	220	$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u^{ef\lambda}\chi_{+fe}D_{\nu\lambda}T_{bcd\mu}$		477
$\bar{T}^{abc\mu}u_{a}{}^{d\nu}u_{b}{}^{e\lambda}h_{d}{}^{f\rho\sigma}\gamma_5\gamma_\lambda D_{\nu\rho\sigma}T_{cef\mu}+\text{H.c.}$	77	221	$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}\chi_{+a}{}^{f}D_{\nu\lambda}T_{bcf\mu}$		478

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}h_d{}^{f\rho\sigma}\gamma_5\gamma_\rho D_{\nu\lambda\sigma}T_{cef\mu}+\text{H.c.}$	78	222	$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_b{}^{e\nu}\chi_{+,s}T_{cde\nu}$	261	479
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}h_e{}^{f\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{bcf\mu}+\text{H.c.}$		223	$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e}{}_{\nu}\chi_{+,s}T_{cde\mu}$	262	480
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}h_e{}^{f\rho\sigma}\gamma_5\gamma_\lambda D_{\nu\rho\sigma}T_{bcf\mu}+\text{H.c.}$		224	$\bar{T}^{abc\mu}u_a{}^{d}{}_{\mu}u_d{}^{e\nu}\chi_{+,s}T_{bce\nu}$	263	481
$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}h_e{}^{f\rho\sigma}\gamma_5\gamma_\rho D_{\nu\lambda\sigma}T_{bcf\mu}+\text{H.c.}$		225	$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\mu}\chi_{+,s}T_{bce\nu}$	264	482
$\bar{T}^{abc\mu}u^{de\nu}u_e{}^{f\lambda}h_{fd}{}^{\rho\sigma}\gamma_5\gamma_\nu D_{\lambda\rho\sigma}T_{abc\mu}+\text{H.c.}$		226	$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e}{}_{\nu}\chi_{+,s}T_{bce\mu}$	265	483
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e}{}_{\lambda}f_{-d}{}^{f}{}_{\rho}{}^{\sigma}T_{cef\sigma}+\text{H.c.}$	79	227	$\bar{T}^{abc\mu}u^{de}{}_{\mu}u_{ed}{}^{\nu}\chi_{+,s}T_{abc\nu}$		484
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}f_{-b}{}^{f}{}_{\rho}{}^{\sigma}T_{cef\sigma}+\text{H.c.}$	80	228	$\bar{T}^{abc\mu}u^{de\nu}u_{ed\nu}\chi_{+,s}T_{abc\mu}$		485
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}f_{-e}{}^{f}{}_{\rho}{}^{\sigma}T_{bcf\sigma}+\text{H.c.}$		229	$\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}\chi_{+,s}D_{\nu\lambda}T_{cde\mu}$	266	486
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}f_{-be\rho}{}^{\sigma}T_{cdf\sigma}+\text{H.c.}$	81	230	$\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}\chi_{+,s}D_{\nu\lambda}T_{bce\mu}$	267	487
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e\sigma}f_{-c}{}^{f}{}_{\lambda\rho}T_{def\sigma}+\text{H.c.}$	82	231	$\bar{T}^{abc\mu}u^{de\nu}u_{ed}{}^{\lambda}\chi_{+,s}D_{\nu\lambda}T_{abc\mu}$		488
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}f_{-de\rho}{}^{\sigma}T_{bcf\sigma}+\text{H.c.}$		232	$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}\chi_{+d}{}^{e}\gamma_5\gamma_\nu D_\lambda T_{bce\mu}+\text{H.c.}$	268	489
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e\sigma}f_{-d}{}^{f}{}_{\lambda\rho}T_{cef\sigma}+\text{H.c.}$	83	233	$\bar{T}^{abc\mu}h_a{}^{d\nu\lambda}\chi_{+d}{}^{e}\gamma_5\gamma_\nu D_\lambda T_{bce\mu}+\text{H.c.}$	269	490
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e\sigma}f_{-e}{}^{f}{}_{\lambda\rho}T_{cdf\sigma}+\text{H.c.}$	84	234	$\bar{T}^{abc\mu}u_a{}^{d\nu}\nabla^{\lambda}\chi_{+d}{}^{e}\gamma_5\gamma_\lambda D_\nu T_{bce\mu}+\text{H.c.}$	270	491
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}f_{-fe\rho}{}^{\sigma}T_{bcd\sigma}+\text{H.c.}$		235	$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}f_{-a}{}^{d}{}_{\nu\lambda}\chi_{+d}{}^{e}T_{bce\rho}+\text{H.c.}$	271	492
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e\sigma}f_{-d}{}^{f}{}_{\lambda\sigma}T_{cef\rho}+\text{H.c.}$	85	236	$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}\nabla_\lambda\chi_{+d}{}^{e}T_{bce\rho}+\text{H.c.}$	272	493
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e\sigma}f_{-b}{}^{f}{}_{\lambda\rho}T_{cef\sigma}+\text{H.c.}$	86	237	$\bar{T}^{abc\mu}\nabla^{\nu}\nabla_\nu\chi_{+a}{}^{d}T_{bcd\mu}$	273	494
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e\sigma}f_{-e}{}^{f}{}_{\lambda\rho}T_{bcf\sigma}+\text{H.c.}$		238	$\bar{T}^{abc\mu}\nabla^{\nu}\nabla_\nu\chi_{+,s}T_{abc\mu}$	274	495
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e\sigma}f_{-e}{}^{f}{}_{\lambda\sigma}T_{bcf\rho}+\text{H.c.}$		239	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}\chi_{+b}{}^{e}T_{cde\nu}$	275	496
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef\sigma}f_{-be\lambda\rho}T_{cdf\sigma}+\text{H.c.}$	87	240	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}\chi_{+d}{}^{e}T_{bce\nu}+\text{H.c.}$	276	497
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef\sigma}f_{-de\lambda\rho}T_{bcf\sigma}+\text{H.c.}$		241	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}\chi_{+a}{}^{d}T_{bcd\nu}$	277	
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef\sigma}f_{-fe\lambda\rho}T_{bcd\sigma}+\text{H.c.}$		242	$i\bar{T}^{abc\mu}f_{+}{}^{de}{}_{\mu}{}^{\nu}\chi_{+ed}T_{abc\nu}$		498
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u^{de}{}_{\nu}u_e{}^{f}{}_{\lambda}f_{-ad\rho}{}^{\sigma}T_{bcf\sigma}+\text{H.c.}$		243	$i\bar{T}^{abc\mu}f_{+a}{}^{d}{}_{\mu}{}^{\nu}\chi_{+,s}T_{bcd\nu}$	278	499
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u^{de}{}_{\nu}u_e{}^{f}{}_{\lambda}f_{-fd\rho}{}^{\sigma}T_{abc\sigma}+\text{H.c.}$		244	$i\bar{T}^{abc\mu}f_{s,+\mu}{}^{\nu}\chi_{+,s}T_{abc\nu}$	279	
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d\sigma}u_d{}^{e}{}_{\nu}f_{-e}{}^{f}{}_{\lambda\rho}T_{bcf\sigma}+\text{H.c.}$		245	$\bar{T}^{abc\mu}\chi_{+a}{}^{d}\chi_{+b}{}^{e}T_{cde\mu}$	280	500
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u^{de}{}_{\nu}u_{ed}{}^{\sigma}f_{-a}{}^{f}{}_{\lambda\rho}T_{bcf\sigma}+\text{H.c.}$		246	$\bar{T}^{abc\mu}\chi_{+a}{}^{d}\chi_{+d}{}^{e}T_{bce\mu}$	281	501
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u^{de}{}_{\nu}u_e{}^{f\sigma}f_{-ad\lambda\rho}T_{bcf\sigma}+\text{H.c.}$		247	$\bar{T}^{abc\mu}\chi_{+}{}^{de}\chi_{+ed}T_{abc\mu}$		502
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d\sigma}u^{ef}{}_{\nu}f_{-fe\lambda\rho}T_{bcd\sigma}+\text{H.c.}$		248	$\bar{T}^{abc\mu}\chi_{+a}{}^{d}\chi_{+,s}T_{bcd\mu}$	282	503
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e}{}_{\lambda}h_d{}^{f}{}_{\rho}{}^{\sigma}T_{cef\sigma}+\text{H.c.}$	88	249	$\bar{T}^{abc\mu}\chi_{+,s}\chi_{+,s}T_{abc\mu}$	283	504
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}h_b{}^{f}{}_{\rho}{}^{\sigma}T_{cef\sigma}+\text{H.c.}$	89	250	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}\chi_{-d}{}^{f}\gamma_5\gamma_\nu D_\lambda T_{cef\mu}+\text{H.c.}$	284	505
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}h_e{}^{f}{}_{\rho}{}^{\sigma}T_{bcf\sigma}+\text{H.c.}$		251	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_b{}^{e\lambda}\chi_{-d}{}^{f}\gamma_5\gamma_\lambda D_\nu T_{cef\mu}+\text{H.c.}$	285	506
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}h_{de\rho}{}^{\sigma}T_{bcf\sigma}+\text{H.c.}$		252	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}\chi_{-b}{}^{f}\gamma_5\gamma_\nu D_\lambda T_{cef\mu}+\text{H.c.}$	286	507
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}h_{fe\rho}{}^{\sigma}T_{bcd\sigma}+\text{H.c.}$		253	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}\chi_{-e}{}^{f}\gamma_5\gamma_\nu D_\lambda T_{bcf\mu}+\text{H.c.}$		508
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e\sigma}h_d{}^{f}{}_{\lambda\sigma}T_{cef\rho}+\text{H.c.}$	90	254	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}\chi_{-e}{}^{f}\gamma_5\gamma_\lambda D_\nu T_{bcf\mu}+\text{H.c.}$		509
$\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e\sigma}h_e{}^{f}{}_{\lambda\sigma}T_{bcf\rho}+\text{H.c.}$		255	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u^{ef\lambda}\chi_{-de}\gamma_5\gamma_\nu D_\lambda T_{bcf\mu}+\text{H.c.}$		510
$\bar{T}^{abc\mu}f_{-a}{}^{d}{}_{\mu}{}^{\nu}f_{-b}{}^{e}{}_{\nu}{}^{\lambda}T_{cde\lambda}$	91	256	$i\bar{T}^{abc\mu}u^{de\nu}u_e{}^{f\lambda}\chi_{-fd}\gamma_5\gamma_\nu D_\lambda T_{abc\mu}+\text{H.c.}$		511
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-b}{}^{e}{}_{\nu\lambda}T_{cde\mu}$	92	257	$i\bar{T}^{abc\mu}u_a{}^{d\nu}u_d{}^{e\lambda}\chi_{-,s}\gamma_5\gamma_\nu D_\lambda T_{bce\mu}+\text{H.c.}$	287	512
$\bar{T}^{abc\mu}f_{-a}{}^{d}{}_{\mu}{}^{\nu}f_{-d}{}^{e}{}_{\nu}{}^{\lambda}T_{bce\lambda}$	93	258	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_b{}^{e}{}_{\lambda}\chi_{-d}{}^{f}T_{cef\rho}+\text{H.c.}$	288	513
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\mu\nu}T_{bce\lambda}$	94	259	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}\chi_{-b}{}^{f}T_{cef\rho}$	289	514
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\nu\lambda}T_{bce\mu}$	95	260	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}\chi_{-e}{}^{f}T_{bcf\rho}+\text{H.c.}$		515
$\bar{T}^{abc\mu}f_{-}{}^{de}{}_{\mu}{}^{\nu}f_{-ed\nu}{}^{\lambda}T_{abc\lambda}$		261	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u^{ef}{}_{\lambda}\chi_{-de}T_{bcf\rho}$		516
$\bar{T}^{abc\mu}f_{-}{}^{de\nu\lambda}f_{-ed\nu\lambda}T_{abc\mu}$		262	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u^{de}{}_{\nu}u_e{}^{f}{}_{\lambda}\chi_{-fd}T_{abc\rho}$		517
$\bar{T}^{abc\mu}f_{-a}{}^{d}{}_{\mu}{}^{\nu}f_{-b}{}^{e\lambda\rho}D_{\nu\lambda}T_{cde\rho}$	96	263	$i\epsilon^{\mu\nu\lambda\rho}\bar{T}^{abc}{}_{\mu}u_a{}^{d}{}_{\nu}u_d{}^{e}{}_{\lambda}\chi_{-,s}T_{bce\rho}$	290	518
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-b}{}^{e}{}_{\nu}{}^{\rho}D_{\lambda\rho}T_{cde\mu}$	97	264	$i\bar{T}^{abc\mu}f_{-a}{}^{d}{}_{\mu}{}^{\nu}\chi_{-d}{}^{e}T_{bce\nu}+\text{H.c.}$	291	519
$\bar{T}^{abc\mu}f_{-a}{}^{d}{}_{\mu}{}^{\nu}f_{-d}{}^{e\lambda\rho}D_{\nu\lambda}T_{bce\rho}$	98	265	$i\bar{T}^{abc\mu}h_a{}^{d}{}_{\mu}{}^{\nu}\chi_{-b}{}^{e}T_{cde\nu}$	292	520
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\mu}{}^{\rho}D_{\nu\rho}T_{bce\lambda}$	99	266	$i\bar{T}^{abc\mu}h_a{}^{d}{}_{\mu}{}^{\nu}\chi_{-d}{}^{e}T_{bce\nu}+\text{H.c.}$	293	521
$\bar{T}^{abc\mu}f_{-a}{}^{d\nu\lambda}f_{-d}{}^{e}{}_{\nu}{}^{\rho}D_{\lambda\rho}T_{bce\mu}$	100	267	$i\bar{T}^{abc\mu}h^{de}{}_{\mu}{}^{\nu}\chi_{-ed}T_{abc\nu}$		522
$\bar{T}^{abc\mu}f_{-}{}^{de}{}_{\mu}{}^{\nu}f_{-ed}{}^{\lambda\rho}D_{\nu\lambda}T_{abc\rho}$		268	$i\bar{T}^{abc\mu}h_a{}^{d\nu\lambda}\chi_{-b}{}^{e}D_{\nu\lambda}T_{cde\mu}$	294	523
$\bar{T}^{abc\mu}f_{-}{}^{de\nu\lambda}f_{-ed\nu}{}^{\rho}D_{\lambda\rho}T_{abc\mu}$		269	$i\bar{T}^{abc\mu}h_a{}^{d\nu\lambda}\chi_{-d}{}^{e}D_{\nu\lambda}T_{bce\mu}+\text{H.c.}$	295	524

(Table continued)

TABLE V. *(Continued)*

$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$O_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$i\bar{T}^{abc\mu} f_{-a}{}^{d}{}_{\mu}{}^{\nu} f_{-b}{}^{e\lambda\rho} \sigma_{\nu\lambda} T_{cde\rho}$	101	270	$i\bar{T}^{abc\mu} h^{de\nu\lambda} \chi_{-ed} D_{\nu\lambda} T_{abc\mu}$		525
$i\bar{T}^{abc\mu} f_{-a}{}^{d}{}_{\mu}{}^{\nu} f_{-d}{}^{e\lambda\rho} \sigma_{\nu\lambda} T_{bce\rho}$	102	271	$i\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} \chi_{-,s} T_{bcd\nu}$	296	526
$i\bar{T}^{abc\mu} f_{-}{}^{de}{}_{\mu}{}^{\nu} f_{-ed}{}^{\lambda\rho} \sigma_{\nu\lambda} T_{abc\rho}$		272	$i\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} \chi_{-,s} D_{\nu\lambda} T_{bcd\mu}$	297	527
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} f_{-b}{}^{e}{}_{\nu}{}^{\lambda} T_{cde\lambda} + \text{H.c.}$	103	273	$i\bar{T}^{abc\mu} u_a{}^{d\nu} \nabla_\nu \chi_{-b}{}^{e} T_{cde\mu}$	298	528
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} f_{-d}{}^{e}{}_{\nu}{}^{\lambda} T_{bce\lambda} + \text{H.c.}$	104	274	$i\bar{T}^{abc\mu} u_a{}^{d\nu} \nabla_\nu \chi_{-d}{}^{e} T_{bce\mu} + \text{H.c.}$	299	529
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} f_{-d}{}^{e}{}_{\mu\nu} T_{bce\lambda} + \text{H.c.}$	105	275	$i\bar{T}^{abc\mu} u^{de\nu} \nabla_\nu \chi_{-ed} T_{abc\mu}$		530
$\bar{T}^{abc\mu} h^{de}{}_{\mu}{}^{\nu} f_{-ed\nu}{}^{\lambda} T_{abc\lambda} + \text{H.c.}$		276	$i\bar{T}^{abc\mu} u_a{}^{d\nu} \nabla_\nu \chi_{-,s} T_{bcd\mu}$	300	531
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} f_{-b}{}^{e\lambda\rho} D_{\nu\lambda} T_{cde\rho} + \text{H.c.}$	106	277	$\bar{T}^{abc\mu} f_{+a}{}^{d\nu\lambda} \chi_{-b}{}^{e} \gamma_5 \gamma_\nu D_\lambda T_{cde\mu}$	301	532
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} f_{-b}{}^{e}{}_{\nu}{}^{\rho} D_{\lambda\rho} T_{cde\mu}$	107	278	$\bar{T}^{abc\mu} f_{+a}{}^{d\nu\lambda} \chi_{-d}{}^{e} \gamma_5 \gamma_\nu D_\lambda T_{bce\mu} + \text{H.c.}$	302	533
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} f_{-d}{}^{e\lambda\rho} D_{\nu\lambda} T_{bce\rho} + \text{H.c.}$	108	279	$\bar{T}^{abc\mu} f_{s,+}{}^{\nu\lambda} \chi_{-a}{}^{d} \gamma_5 \gamma_\nu D_\lambda T_{bcd\mu}$	303	
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} f_{-d}{}^{e}{}_{\mu}{}^{\rho} D_{\nu\lambda} T_{bce\rho} + \text{H.c.}$	109	280	$\bar{T}^{abc\mu} f_{+}{}^{de\nu\lambda} \chi_{-ed} \gamma_5 \gamma_\nu D_\lambda T_{abc\mu}$		534
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} f_{-d}{}^{e}{}_{\nu}{}^{\rho} D_{\lambda\rho} T_{bce\mu} + \text{H.c.}$	110	281	$\bar{T}^{abc\mu} f_{+a}{}^{d\nu\lambda} \chi_{-,s} \gamma_5 \gamma_\nu D_\lambda T_{bcd\mu}$	304	535
$\bar{T}^{abc\mu} h^{de}{}_{\mu}{}^{\nu} f_{-ed}{}^{\lambda\rho} D_{\nu\lambda} T_{abc\rho} + \text{H.c.}$		282	$\bar{T}^{abc\mu} f_{s,+}{}^{\nu\lambda} \chi_{-,s} \gamma_5 \gamma_\nu D_\lambda T_{abc\mu}$	305	
$\bar{T}^{abc\mu} h^{de\nu\lambda} f_{-ed\nu}{}^{\rho} D_{\lambda\rho} T_{abc\mu}$		283	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{+a}{}^{d}{}_{\nu\lambda} \chi_{-b}{}^{e} T_{cde\rho}$	306	536
$i\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} f_{-d}{}^{e\lambda\rho} \sigma_{\nu\lambda} T_{bce\rho} + \text{H.c.}$	111	284	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{+a}{}^{d}{}_{\nu\lambda} \chi_{-d}{}^{e} T_{bce\rho} + \text{H.c.}$	307	537
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} h_b{}^{e}{}_{\nu}{}^{\lambda} T_{cde\lambda}$	112	285	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{s,+\nu\lambda} \chi_{-a}{}^{d} T_{bcd\rho}$	308	
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_b{}^{e}{}_{\nu\lambda} T_{cde\mu}$	113	286	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{+}{}^{de}{}_{\nu\lambda} \chi_{-ed} T_{abc\rho}$		538
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} h_d{}^{e}{}_{\nu}{}^{\lambda} T_{bce\lambda}$	114	287	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{+a}{}^{d}{}_{\nu\lambda} \chi_{-,s} T_{bcd\rho}$	309	539
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_d{}^{e}{}_{\nu\lambda} T_{bce\mu}$	115	288	$\epsilon^{\mu\nu\lambda\rho} \bar{T}^{abc}{}_{\mu} f_{s,+\nu\lambda} \chi_{-,s} T_{abc\rho}$	310	
$\bar{T}^{abc\mu} h^{de}{}_{\mu}{}^{\nu} h_{ed\nu}{}^{\lambda} T_{abc\lambda}$		289	$\bar{T}^{abc\mu} \chi_{-a}{}^{d} \chi_{-b}{}^{e} T_{cde\mu}$	311	540
$\bar{T}^{abc\mu} h^{de\nu\lambda} h_{ed\nu\lambda} T_{abc\mu}$		290	$\bar{T}^{abc\mu} \chi_{-a}{}^{d} \chi_{-d}{}^{e} T_{bce\mu}$		541
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} h_b{}^{e\lambda\rho} D_{\nu\lambda} T_{cde\rho}$	116	291	$\bar{T}^{abc\mu} \chi_{-}{}^{de} \chi_{-ed} T_{abc\mu}$		542
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_b{}^{e}{}_{\nu}{}^{\rho} D_{\lambda\rho} T_{cde\mu}$	117	292	$\bar{T}^{abc\mu} \chi_{-a}{}^{d} \chi_{-,s} T_{bcd\mu}$	312	543
$\bar{T}^{abc\mu} h_a{}^{d}{}_{\mu}{}^{\nu} h_d{}^{e\lambda\rho} D_{\nu\lambda} T_{bce\rho}$	118	293	$\bar{T}^{abc\mu} \langle F_{L\mu}{}^{\nu} F_{L\nu}{}^{\lambda} \rangle T_{abc\lambda} + \text{H.c.}$	313	544
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_d{}^{e}{}_{\nu}{}^{\rho} D_{\lambda\rho} T_{bce\mu}$	119	294	$\bar{T}^{abc\mu} \langle F_L{}^{\nu\lambda} F_{L\nu\lambda} \rangle T_{abc\mu} + \text{H.c.}$	314	545
$\bar{T}^{abc\mu} h^{de}{}_{\mu}{}^{\nu} h_{ed}{}^{\lambda\rho} D_{\nu\lambda} T_{abc\rho}$		295	$\bar{T}^{abc\mu} \langle F_{L\mu}{}^{\nu} F_L{}^{\lambda\rho} \rangle D_{\nu\lambda} T_{abc\rho} + \text{H.c.}$	315	546
$\bar{T}^{abc\mu} h^{de\nu\lambda} h_{ed\nu}{}^{\rho} D_{\lambda\rho} T_{abc\mu}$		296	$\bar{T}^{abc\mu} \langle F_L{}^{\nu\lambda} F_{L\nu}{}^{\rho} \rangle D_{\lambda\rho} T_{abc\mu} + \text{H.c.}$	316	547
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_b{}^{e\rho\sigma} D_{\nu\lambda\rho\sigma} T_{cde\mu}$	120	297	$\bar{T}^{abc\mu} \langle \chi\chi^\dagger \rangle T_{abc\mu}$	317	548
$\bar{T}^{abc\mu} h_a{}^{d\nu\lambda} h_d{}^{e\rho\sigma} D_{\nu\lambda\rho\sigma} T_{bce\mu}$	121	298	$\bar{T}^{abc\mu} \det\chi T_{abc\mu} + \text{H.c.}$	318	

TABLE VI. Terms in the $\mathcal{O}(p^3)$ meson-octet-decuplet and $\pi N\Delta$ chiral Lagrangians, where $P_n^{(N_f,3)}$ is defined in Eqs. (64) and (66). For the $SU(2)$ case, the form needs to be changed; see the sentences around Eq. (67).

$P_n^{(N_f,3)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,3)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_e{}^{g\nu} T_{A,n,dfg\nu}$	1	1	$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} f_{-e}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\lambda T_{A,n,cdf\mu}$		36
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g}{}_{\mu} T_{A,n,efg\nu}$	2	2	$\epsilon^{abc} \bar{B}_a{}^{d} u^{ef\mu} f_{-be}{}^{\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,cdf\lambda}$		37
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\mu} T_{A,n,dfg\nu}$		3	$\epsilon^{abc} \bar{B}_a{}^{d} u^{ef\mu} f_{-be}{}^{\nu\lambda} \gamma_5 \gamma_\nu D_\mu T_{A,n,cdf\lambda}$		38
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\nu} T_{A,n,dfg\mu}$	3	4	$\epsilon^{abc} \bar{B}_a{}^{d} u^{ef\mu} f_{-be}{}^{\nu\lambda} \gamma_5 \gamma_\nu D_\lambda T_{A,n,cdf\mu}$		39
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_d{}^{f}{}_{\mu} u_e{}^{g\nu} T_{A,n,cfg\nu}$		5	$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} h_c{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,def\lambda}$	15	40
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\mu} T_{A,n,cfg\nu}$		6	$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} h_d{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,cef\lambda}$	16	41
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\nu} T_{A,n,cfg\mu}$		7	$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} h_e{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,cdf\lambda}$		42
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_e{}^{f}{}_{\mu} u_f{}^{g\nu} T_{A,n,cdg\nu}$		8	$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} h_e{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\mu T_{A,n,cdf\lambda}$		43
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g}{}_{\mu} T_{A,n,cdg\nu}$		9	$\epsilon^{\mu\nu\lambda\rho} \epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e}{}_{\mu} f_{-c}{}^{f}{}_{\nu\lambda} T_{A,n,def\rho}$	17	44
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g}{}_{\nu} T_{A,n,cdg\mu}$		10	$\epsilon^{\mu\nu\lambda\rho} \epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e}{}_{\mu} f_{-d}{}^{f}{}_{\nu\lambda} T_{A,n,cef\rho}$	18	45
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} D_{\mu\lambda} T_{A,n,efg\nu}$	4	11	$\epsilon^{\mu\nu\lambda\rho} \epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e}{}_{\mu} f_{-e}{}^{f}{}_{\nu\lambda} T_{A,n,cdf\rho}$		46
$\epsilon^{abc} \bar{B}_a{}^{d} u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} D_{\mu\nu} T_{A,n,dfg\lambda}$	5	12	$\epsilon^{\mu\nu\lambda\rho} \epsilon^{abc} \bar{B}_a{}^{d} u^{ef}{}_{\mu} f_{-be\nu\lambda} T_{A,n,cdf\rho}$		47

(Table continued)

TABLE VI. *(Continued)*

$P_n^{(N_f,3)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,3)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} D_{\mu\lambda} T_{A,n,dfg\nu}$		13	$\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{-b}{}^{e}{}_{\mu}{}^{\nu} T_{A,n,cde\nu}$	19	48
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} D_{\nu\lambda} T_{A,n,dfg\mu}$	6	14	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{-b}{}^{e\nu\lambda} \sigma_{\mu\nu} T_{A,n,cde\lambda}$	20	49
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} D_{\mu\nu} T_{A,n,cfg\lambda}$		15	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} T_{A,n,def\nu}$	21	50
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} D_{\mu\lambda} T_{A,n,cfg\nu}$		16	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f}{}_{\mu} T_{A,n,cef\nu}$	22	51
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} D_{\nu\lambda} T_{A,n,cfg\mu}$		17	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f}{}_{\mu} T_{A,n,cdf\nu}$		52
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} D_{\mu\nu} T_{A,n,cdg\lambda}$		18	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} T_{A,n,cdf\nu}$		53
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} D_{\mu\lambda} T_{A,n,cdg\nu}$		19	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} D_{\mu\lambda} T_{A,n,def\nu}$	23	54
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} D_{\nu\lambda} T_{A,n,cdg\mu}$		20	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} D_{\mu\lambda} T_{A,n,cef\nu}$	24	55
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} \sigma_{\mu\nu} T_{A,n,efg\lambda}$	7	21	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} D_{\mu\lambda} T_{A,n,cdf\nu}$		56
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} \sigma_{\mu\nu} T_{A,n,dfg\lambda}$	8	22	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be}{}^{\lambda} D_{\mu\lambda} T_{A,n,cdf\nu}$		57
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} \sigma_{\mu\lambda} T_{A,n,dfg\nu}$		23	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} \sigma_{\mu\nu} T_{A,n,def\lambda}$	25	58
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} \sigma_{\mu\nu} T_{A,n,cfg\lambda}$		24	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} \sigma_{\mu\nu} T_{A,n,cef\lambda}$	26	59
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} \sigma_{\mu\lambda} T_{A,n,cfg\nu}$		25	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e}{}_{\mu} T_{A,n,cde\nu}$	27	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} \sigma_{\mu\nu} T_{A,n,cdg\lambda}$		26	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} D_{\mu\lambda} T_{A,n,cde\nu}$	28	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} \sigma_{\mu\lambda} T_{A,n,cdg\nu}$		27	$\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} \sigma_{\mu\nu} T_{A,n,cde\lambda}$	29	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-c}{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,def\lambda}$	9	28	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} \sigma_{\mu\nu} T_{A,n,cdf\lambda}$		60
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-c}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\mu T_{A,n,def\lambda}$	10	29	$\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be}{}^{\lambda} \sigma_{\mu\nu} T_{A,n,cdf\lambda}$		61
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-c}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\lambda T_{A,n,def\mu}$	11	30	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \chi_{+c}{}^{f} T_{A,n,def\mu}$	30	62
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-d}{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,cef\lambda}$	12	31	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \chi_{+d}{}^{f} T_{A,n,cef\mu}$	31	63
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-d}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\mu T_{A,n,cef\lambda}$	13	32	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \chi_{+e}{}^{f} T_{A,n,cdf\mu}$		64
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-d}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\lambda T_{A,n,cef\mu}$	14	33	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \chi_{+be} T_{A,n,cdf\mu}$		65
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-e}{}^{f\nu\lambda} \gamma_5 \gamma_\mu D_\nu T_{A,n,cdf\lambda}$		34	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \chi_{+,s} T_{A,n,cde\mu}$	32	66
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} f_{-e}{}^{f\nu\lambda} \gamma_5 \gamma_\nu D_\mu T_{A,n,cdf\lambda}$		35	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu \chi_{-b}{}^{e} T_{A,n,cde\mu}$	33	67

TABLE VII. Terms in the $\mathcal{O}(p^4)$ meson-octet-decuplet and $\pi N\Delta$ chiral Lagrangians, where $P_n^{(N_f,4)}$ is defined in Eqs. (64) and (66). For the $SU(2)$ case, the form needs to be changed; see the sentences around Eq. (67).

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_d{}^{g\nu} u_e{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,fgh\lambda}$	1	1	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-c}{}^{f}{}_{\mu}{}^{\lambda} \gamma_5 \gamma_\nu T_{A,n,def\lambda}$	78	322
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_d{}^{g\nu} u_e{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,fgh\nu}$	2	2	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-c}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\mu T_{A,n,def\lambda}$	79	323
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_e{}^{g\nu} u_f{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,dgh\lambda}$		3	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-c}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\lambda T_{A,n,def\mu}$	80	324
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_e{}^{g\nu} u_g{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,dfh\lambda}$		4	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla_\mu f_{-d}{}^{f\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cef\lambda}$	81	325
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f}{}_{\mu} u_e{}^{g\nu} u_g{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,dfh\nu}$		5	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-d}{}^{f}{}_{\mu}{}^{\lambda} \gamma_5 \gamma_\nu T_{A,n,cef\lambda}$	82	326
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g}{}_{\mu} u_e{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,fgh\lambda}$	3	6	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-d}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\mu T_{A,n,cef\lambda}$	83	327
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g}{}_{\mu} u_e{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,fgh\nu}$		7	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-d}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\lambda T_{A,n,cef\mu}$	84	328
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g}{}_{\mu} u_f{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,egh\lambda}$	4	8	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla_\mu f_{-e}{}^{f\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		329
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g}{}_{\mu} u_f{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,egh\nu}$	5	9	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-e}{}^{f}{}_{\mu}{}^{\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		330
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\mu} \gamma_5 \gamma_\nu T_{A,n,fgh\lambda}$		10	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-e}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\mu T_{A,n,cdf\lambda}$		331
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\mu} \gamma_5 \gamma_\lambda T_{A,n,fgh\nu}$		11	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu f_{-e}{}^{f}{}_{\nu}{}^{\lambda} \gamma_5 \gamma_\lambda T_{A,n,cdf\mu}$		332
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\nu} \gamma_5 \gamma_\mu T_{A,n,fgh\lambda}$	6	12	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \nabla_\mu f_{-be}{}^{\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		333
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\nu} \gamma_5 \gamma_\lambda T_{A,n,fgh\mu}$	7	13	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \nabla^\nu f_{-be\mu}{}^{\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		334
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\lambda} \gamma_5 \gamma_\mu T_{A,n,fgh\nu}$		14	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \nabla^\nu f_{-be\nu}{}^{\lambda} \gamma_5 \gamma_\mu T_{A,n,cdf\lambda}$		335
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h}{}_{\lambda} \gamma_5 \gamma_\nu T_{A,n,fgh\mu}$		15	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \nabla^\nu f_{-be\nu}{}^{\lambda} \gamma_5 \gamma_\lambda T_{A,n,cdf\mu}$		336
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\mu} u_f{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,dgh\lambda}$		16	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla_\mu h_c{}^{f\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,def\lambda}$	85	337
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\mu} u_f{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,dgh\nu}$		17	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla_\mu h_d{}^{f\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cef\lambda}$	86	338
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\mu} u_g{}^{h\lambda} \gamma_5 \gamma_\nu T_{A,n,dfh\lambda}$		18	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla_\mu h_e{}^{f\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		339
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\mu} u_g{}^{h\lambda} \gamma_5 \gamma_\lambda T_{A,n,dfh\nu}$		19	$\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu} \nabla_\mu h_{be}{}^{\nu\lambda} \gamma_5 \gamma_\nu T_{A,n,cdf\lambda}$		340

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\nu} u_f{}^{h\lambda}\gamma_5\gamma_\mu T_{A,n,dgh\lambda}$		20	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e}{}_{\mu\nu} f_{-c}{}^{f}{}_{\lambda}{}^{\sigma} D_\rho T_{A,n,def\sigma}$	87	341
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\nu} u_f{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,dgh\mu}$		21	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e}{}_{\mu\nu} f_{-e}{}^{f}{}_{\lambda}{}^{\sigma} D_\rho T_{A,n,cdf\sigma}$		342
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\nu} u_g{}^{h\lambda}\gamma_5\gamma_\mu T_{A,n,dfh\lambda}$		22	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e}{}_{\mu}{}^{\sigma} f_{-c}{}^{f}{}_{\nu\lambda} D_\rho T_{A,n,def\sigma}$	88	343
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g}{}_{\nu} u_g{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,dfh\mu}$		23	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e}{}_{\mu}{}^{\sigma} f_{-d}{}^{f}{}_{\nu\lambda} D_\rho T_{A,n,cef\sigma}$	89	344
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,dgh\nu}$		24	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e}{}_{\mu}{}^{\sigma} f_{-e}{}^{f}{}_{\nu\lambda} D_\rho T_{A,n,cdf\sigma}$		345
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,dfh\lambda}$		25	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d h^{ef}{}_{\mu}{}^{\sigma} f_{-be\nu\lambda} D_\rho T_{A,n,cdf\sigma}$		346
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,dfh\nu}$		26	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_d{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,efg\lambda}$	90	347
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\nu}\gamma_5\gamma_\mu T_{A,n,dfh\lambda}$		27	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_d{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,efg\nu}$	91	348
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\nu}\gamma_5\gamma_\lambda T_{A,n,dfh\mu}$		28	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_e{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,dfg\lambda}$	92	349
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,dfh\nu}$		29	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_e{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,dfg\nu}$	93	350
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\lambda}\gamma_5\gamma_\nu T_{A,n,dfh\mu}$		30	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,deg\lambda}$	94	351
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f}{}_{\mu} u_e{}^{g\nu} u_f{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cgh\lambda}$		31	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,deg\nu}$	95	352
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f}{}_{\mu} u_e{}^{g\nu} u_g{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cfh\lambda}$		32	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,efg\lambda}$	96	353
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f}{}_{\mu} u_e{}^{g\nu} u_g{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cfh\nu}$		33	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,efg\nu}$	97	354
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f}{}_{\mu} u^{gh\nu} u_{hg}{}^{\lambda}\gamma_5\gamma_\nu T_{A,n,cef\lambda}$		34	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,efg\nu}$	98	355
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\mu} u_f{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cgh\lambda}$		35	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,dfg\lambda}$		356
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\mu} u_f{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cgh\nu}$		36	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,dfg\nu}$		357
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\mu} u_g{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cfh\lambda}$		37	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,dfg\nu}$	99	358
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\nu} u_f{}^{h\lambda}\gamma_5\gamma_\mu T_{A,n,cgh\lambda}$		38	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,deg\lambda}$	100	359
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\nu} u_f{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cgh\mu}$		39	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,deg\nu}$	101	360
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\nu} u_g{}^{h\lambda}\gamma_5\gamma_\mu T_{A,n,cfh\lambda}$		40	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,deg\nu}$	102	361
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g}{}_{\nu} u_g{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cfh\mu}$		41	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f}{}_{\mu} u_e{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,cfg\lambda}$		362
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,cgh\nu}$		42	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f}{}_{\mu} u_e{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,cfg\nu}$		363
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h}{}_{\nu}\gamma_5\gamma_\mu T_{A,n,cfh\lambda}$		43	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,ceg\lambda}$		364
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f}{}_{\mu} u_f{}^{g\nu} u_g{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cdh\lambda}$		44	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,ceg\nu}$		365
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f}{}_{\mu} u_f{}^{g\nu} u_g{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cdh\nu}$		45	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,cfg\lambda}$		366
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f}{}_{\mu} u^{gh\nu} u_{hg}{}^{\lambda}\gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		46	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,cfg\nu}$		367
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g}{}_{\mu} u_g{}^{h\lambda}\gamma_5\gamma_\nu T_{A,n,cdh\lambda}$		47	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,cfg\nu}$		368
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g}{}_{\mu} u_g{}^{h\lambda}\gamma_5\gamma_\lambda T_{A,n,cdh\nu}$		48	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,ceg\lambda}$		369
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,cdh\lambda}$		49	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,ceg\nu}$		370
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h}{}_{\nu}\gamma_5\gamma_\mu T_{A,n,cdh\lambda}$		50	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,ceg\nu}$		371
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h}{}_{\nu}\gamma_5\gamma_\lambda T_{A,n,cdh\mu}$		51	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,cdg\lambda}$		372
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\mu D_\nu T_{A,n,fgh\rho}$	8	52	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f}{}_{\mu} u_f{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,cdg\nu}$		373
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\mu D_\rho T_{A,n,fgh\lambda}$	9	53	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,cdg\lambda}$		374
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\mu D_\lambda T_{A,n,fgh\nu}$		54	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,cdg\nu}$		375
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\nu D_\mu T_{A,n,fgh\rho}$	10	55	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g}{}_{\lambda}\gamma_5\gamma_\mu T_{A,n,cdg\nu}$		376
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\nu D_\rho T_{A,n,fgh\lambda}$	11	56	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg}{}_{\mu} u_{gf}{}^{\lambda}\gamma_5\gamma_\nu T_{A,n,cde\lambda}$		377
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\nu D_\lambda T_{A,n,fgh\mu}$	12	57	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg}{}_{\mu} u_{gf}{}^{\lambda}\gamma_5\gamma_\lambda T_{A,n,cde\nu}$		378
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,fgh\rho}$	13	58	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg\lambda} u_{gf\lambda}\gamma_5\gamma_\mu T_{A,n,cde\nu}$		379
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,fgh\nu}$		59	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_c{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,dfg\lambda}$		380
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\lambda D_{\nu\rho} T_{A,n,fgh\mu}$	14	60	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_c{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,dfg\nu}$		381
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\nu} T_{A,n,fgh\lambda}$		61	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_d{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,cfg\lambda}$		382
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,fgh\nu}$		62	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_d{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,cfg\nu}$		383
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_d{}^{g\lambda} u_e{}^{h\rho}\gamma_5\gamma_\rho D_{\nu\lambda} T_{A,n,fgh\mu}$		63	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_f{}^{g\lambda}\gamma_5\gamma_\nu T_{A,n,cdg\lambda}$		384
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,dgh\rho}$		64	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be\mu} u_f{}^{g\lambda}\gamma_5\gamma_\lambda T_{A,n,cdg\nu}$		385
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,dgh\lambda}$		65	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be}{}^{\lambda} u_c{}^{g}{}_{\mu}\gamma_5\gamma_\nu T_{A,n,dfg\lambda}$		386
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,dgh\nu}$		66	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} u_{be}{}^{\lambda} u_c{}^{g}{}_{\mu}\gamma_5\gamma_\lambda T_{A,n,dfg\nu}$		387

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,dgh\rho}$		67	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^g{}_\lambda\gamma_5\gamma_\mu T_{A,n,dfg\nu}$		388
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,dgh\nu}$		68	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^g{}_\mu\gamma_5\gamma_\nu T_{A,n,cfg\lambda}$		389
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\nu\rho} T_{A,n,dgh\mu}$		69	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^g{}_\mu\gamma_5\gamma_\lambda T_{A,n,cfg\nu}$		390
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,dfh\rho}$		70	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^g{}_\lambda\gamma_5\gamma_\mu T_{A,n,cfg\nu}$		391
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,dfh\lambda}$		71	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^g{}_\mu\gamma_5\gamma_\nu T_{A,n,cdg\lambda}$		392
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,dfh\nu}$		72	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^g{}_\mu\gamma_5\gamma_\lambda T_{A,n,cdg\nu}$		393
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\lambda} T_{A,n,dfh\rho}$		73	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^g{}_\lambda\gamma_5\gamma_\mu T_{A,n,cdg\nu}$		394
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\rho} T_{A,n,dfh\lambda}$		74	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_b{}^g{}_\mu u_{ge}{}^\lambda\gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		395
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\lambda\rho} T_{A,n,dfh\mu}$		75	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_b{}^g{}_\mu u_{ge}{}^\lambda\gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		396
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,dfh\rho}$		76	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,efg\rho}$	103	397
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,dfh\nu}$		77	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,efg\lambda}$	104	398
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\lambda D_{\nu\rho} T_{A,n,dfh\mu}$		78	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,efg\nu}$	105	399
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\nu} T_{A,n,dfh\lambda}$		79	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\mu\rho} T_{A,n,efg\nu}$	106	400
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,dfh\nu}$		80	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_d{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,efg\nu}$	107	401
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\rho D_{\nu\lambda} T_{A,n,dfh\mu}$		81	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,dfg\rho}$	108	402
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cgh\rho}$		82	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,dfg\lambda}$		403
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cgh\lambda}$		83	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,dfg\nu}$	109	404
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cgh\nu}$		84	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,dfg\nu}$	110	405
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cgh\rho}$		85	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,dfg\nu}$		406
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cgh\nu}$		86	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,deg\rho}$	111	407
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_f{}^{h\rho}\gamma_5\gamma_\lambda D_{\nu\rho} T_{A,n,cgh\mu}$		87	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,deg\lambda}$	112	408
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cfh\rho}$		88	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,deg\nu}$	113	409
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cfh\lambda}$		89	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,deg\nu}$	114	410
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\lambda} T_{A,n,cfh\rho}$		90	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{e\mu\nu} u_c{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,deg\nu}$	115	411
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\rho} T_{A,n,cfh\lambda}$		91	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^e{}_\mu u_c{}^{f\lambda}\gamma_5\gamma_\nu T_{A,n,def\lambda}$	116	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\lambda\rho} T_{A,n,cfh\mu}$		92	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^e{}_\mu u_c{}^{f\lambda}\gamma_5\gamma_\lambda T_{A,n,def\nu}$	117	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cfh\rho}$		93	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^e{}_\mu u_d{}^{f\lambda}\gamma_5\gamma_\nu T_{A,n,cef\lambda}$	118	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} u_e{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\lambda D_{\nu\rho} T_{A,n,cfh\mu}$		94	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^e{}_\mu u_d{}^f{}_\lambda\gamma_5\gamma_\lambda T_{A,n,cef\nu}$	119	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdh\rho}$		95	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_d{}^f{}_\lambda\gamma_5\gamma_\mu T_{A,n,cef\nu}$	120	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cdh\lambda}$		96	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_c{}^{f\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,def\rho}$	121	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cdh\nu}$		97	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_c{}^{f\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,def\nu}$	122	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\lambda} T_{A,n,cdh\rho}$		98	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_d{}^{f\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cef\rho}$	123	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\mu\rho} T_{A,n,cdh\lambda}$		99	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_d{}^{f\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cef\nu}$	124	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\nu D_{\lambda\rho} T_{A,n,cdh\mu}$		100	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} u_b{}^{e\lambda} u_d{}^{f\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cef\nu}$	125	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\nu} T_{A,n,cdh\lambda}$		101	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cfg\rho}$		412
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} u_f{}^{g\lambda} u_g{}^{h\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,cdh\nu}$		102	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cfg\lambda}$		413
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_d{}^g{}_\lambda u_e{}^{h\sigma} D_\rho T_{A,n,fgh\sigma}$	15	103	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cfg\nu}$		414
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_d{}^{g\sigma} u_e{}^h{}_\lambda D_\rho T_{A,n,fgh\sigma}$		104	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cfg\nu}$		415
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_d{}^{g\sigma} u_g{}^h{}_\lambda D_\rho T_{A,n,efh\sigma}$		105	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_e{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,cfg\nu}$		416
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_e{}^g{}_\lambda u_f{}^{h\sigma} D_\rho T_{A,n,dgh\sigma}$		106	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,ceg\rho}$		417
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_e{}^g{}_\lambda u_g{}^{h\sigma} D_\rho T_{A,n,dfh\sigma}$		107	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,ceg\lambda}$		418
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u_e{}^{g\sigma} u_g{}^h{}_\lambda D_\rho T_{A,n,dfh\sigma}$		108	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,ceg\nu}$		419
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^f{}_\nu u^{gh}{}_\lambda u_{hg}{}^\sigma D_\rho T_{A,n,def\sigma}$		109	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,ceg\nu}$		420
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_c{}^{f\sigma} u_e{}^g{}_\nu u_f{}^h{}_\lambda D_\rho T_{A,n,dgh\sigma}$		110	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_d{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,ceg\nu}$		421
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_d{}^f{}_\nu u_e{}^g{}_\lambda u_f{}^{h\sigma} D_\rho T_{A,n,cgh\sigma}$		111	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdg\rho}$		422
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_d{}^f{}_\nu u_e{}^g{}_\lambda u_g{}^{h\sigma} D_\rho T_{A,n,cfh\sigma}$		112	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cdg\lambda}$		423
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_e{}^f{}_\nu u_f{}^g{}_\lambda u_g{}^{h\sigma} D_\rho T_{A,n,cdh\sigma}$		113	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cdg\nu}$		424
$\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d u_b{}^e{}_\mu u_e{}^f{}_\nu u_f{}^{g\sigma} u_g{}^h{}_\lambda D_\rho T_{A,n,cdh\sigma}$		114	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdg\nu}$		425

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^f{}_\mu f_{-e}{}^{g\nu\lambda} D_\nu T_{A,n,dfg\lambda}$	16	115	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u_e{}^{f\lambda} u_f{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,cdg\nu}$		426
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-d}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,efg\lambda}$	17	116	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg\lambda} u_{gf}{}^\rho\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cde\rho}$		427
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-d}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,efg\nu}$	18	117	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg\lambda} u_{gf}{}^\rho\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cde\nu}$		428
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,dfg\lambda}$	19	118	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} u^{fg\lambda} u_{gf}{}^\rho\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cde\nu}$		429
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,dfg\nu}$	20	119	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,dfg\rho}$		430
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^g{}_\nu{}^\lambda D_\mu T_{A,n,dfg\lambda}$	21	120	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,dfg\lambda}$		431
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,dfg\mu}$	22	121	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,dfg\nu}$		432
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^f{}_\mu f_{-c}{}^{g\nu\lambda} D_\nu T_{A,n,efg\lambda}$	23	122	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,dfg\nu}$		433
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^f{}_\mu f_{-e}{}^{g\nu\lambda} D_\nu T_{A,n,cfg\lambda}$		123	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_c{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,dfg\nu}$		434
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-c}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,efg\lambda}$	24	124	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cfg\rho}$		435
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-c}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,efg\nu}$	25	125	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cfg\lambda}$		436
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cfg\lambda}$		126	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cfg\nu}$		437
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cfg\nu}$		127	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cfg\nu}$		438
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cfg\lambda}$		128	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_d{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,cfg\nu}$		439
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,cfg\mu}$		129	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdg\rho}$		440
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu f_{-c}{}^{g\nu\lambda} D_\nu T_{A,n,dfg\lambda}$		130	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\nu\rho} T_{A,n,cdg\lambda}$		441
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu f_{-d}{}^{g\nu\lambda} D_\nu T_{A,n,cfg\lambda}$		131	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^{g\rho}\gamma_5\gamma_\mu D_{\lambda\rho} T_{A,n,cdg\nu}$		442
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu f_{-f}{}^{g\nu\lambda} D_\nu T_{A,n,cdg\lambda}$		132	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^{g\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdg\nu}$		443
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,dfg\lambda}$		133	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_{be}{}^\lambda u_f{}^{g\rho}\gamma_5\gamma_\rho D_{\mu\lambda} T_{A,n,cdg\nu}$		444
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,dfg\nu}$		134	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_b{}^{g\lambda} u_{ge}{}^\rho\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		445
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^g{}_\nu{}^\lambda D_\mu T_{A,n,dfg\lambda}$		135	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} u_b{}^{g\lambda} u_{ge}{}^\rho\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdf\nu}$		446
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,dfg\mu}$		136	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^f{}_\lambda u_d{}^{g\sigma} D_\rho T_{A,n,efg\sigma}$	126	447
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cfg\lambda}$		137	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^f{}_\lambda u_e{}^{g\sigma} D_\rho T_{A,n,dfg\sigma}$	127	448
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cfg\nu}$		138	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^f{}_\lambda u_f{}^{g\sigma} D_\rho T_{A,n,deg\sigma}$	128	449
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cfg\lambda}$		139	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^{f\sigma} u_d{}^g{}_\lambda D_\rho T_{A,n,efg\sigma}$	129	450
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,cfg\mu}$		140	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^{f\sigma} u_e{}^g{}_\lambda D_\rho T_{A,n,dfg\sigma}$		451
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cdg\lambda}$		141	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_c{}^{f\sigma} u_f{}^g{}_\lambda D_\rho T_{A,n,deg\sigma}$	130	452
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cdg\nu}$		142	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{s,+\mu\nu} u_b{}^e{}_\lambda u_c{}^{f\sigma} D_\rho T_{A,n,def\sigma}$	131	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cdg\lambda}$		143	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{s,+\mu\nu} u_b{}^e{}_\lambda u_d{}^{f\sigma} D_\rho T_{A,n,cef\sigma}$	132	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,cdg\mu}$		144	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_d{}^f{}_\lambda u_e{}^{g\sigma} D_\rho T_{A,n,cfg\sigma}$		453
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu f_{-cf}{}^{\nu\lambda} D_\nu T_{A,n,deg\lambda}$	26	145	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_d{}^f{}_\lambda u_f{}^{g\sigma} D_\rho T_{A,n,ceg\sigma}$		454
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu f_{-df}{}^{\nu\lambda} D_\nu T_{A,n,ceg\lambda}$		146	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_d{}^{f\sigma} u_e{}^g{}_\lambda D_\rho T_{A,n,cfg\sigma}$		455
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu f_{-ef}{}^{\nu\lambda} D_\nu T_{A,n,cdg\lambda}$		147	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_d{}^{f\sigma} u_f{}^g{}_\lambda D_\rho T_{A,n,ceg\sigma}$		456
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu f_{-gf}{}^{\nu\lambda} D_\nu T_{A,n,cde\lambda}$		148	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_e{}^f{}_\lambda u_f{}^{g\sigma} D_\rho T_{A,n,cdg\sigma}$		457
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf\mu}{}^\lambda D_\nu T_{A,n,deg\lambda}$	27	149	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u_e{}^{f\sigma} u_f{}^g{}_\lambda D_\rho T_{A,n,cdg\sigma}$		458
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf\mu}{}^\lambda D_\lambda T_{A,n,deg\nu}$	28	150	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} u^{fg}{}_\lambda u_{gf}{}^\sigma D_\rho T_{A,n,cde\sigma}$		459
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf\nu}{}^\lambda D_\mu T_{A,n,deg\lambda}$		151	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be\lambda} u_c{}^{g\sigma} D_\rho T_{A,n,dfg\sigma}$		460
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf\nu}{}^\lambda D_\lambda T_{A,n,deg\mu}$		152	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be\lambda} u_d{}^{g\sigma} D_\rho T_{A,n,cfg\sigma}$		461
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df\mu}{}^\lambda D_\nu T_{A,n,ceg\lambda}$		153	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be\lambda} u_f{}^{g\sigma} D_\rho T_{A,n,cdg\sigma}$		462
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df\mu}{}^\lambda D_\lambda T_{A,n,ceg\nu}$		154	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be}{}^\sigma u_c{}^g{}_\lambda D_\rho T_{A,n,dfg\sigma}$		463
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df\nu}{}^\lambda D_\mu T_{A,n,ceg\lambda}$		155	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be}{}^\sigma u_d{}^g{}_\lambda D_\rho T_{A,n,cfg\sigma}$		464
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df\nu}{}^\lambda D_\lambda T_{A,n,ceg\mu}$		156	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_{be}{}^\sigma u_f{}^g{}_\lambda D_\rho T_{A,n,cdg\sigma}$		465
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef\mu}{}^\lambda D_\nu T_{A,n,cdg\lambda}$		157	$i\varepsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef}{}_{\mu\nu} u_b{}^g{}_\lambda u_{ge}{}^\sigma D_\rho T_{A,n,cdf\sigma}$		466
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef\mu}{}^\lambda D_\lambda T_{A,n,cdg\nu}$		158	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-c}{}^f{}_\mu{}^\lambda D_\nu T_{A,n,def\lambda}$	133	467
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef\nu}{}^\lambda D_\mu T_{A,n,cdg\lambda}$		159	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-c}{}^f{}_\mu{}^\lambda D_\lambda T_{A,n,def\nu}$	134	468
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef\nu}{}^\lambda D_\lambda T_{A,n,cdg\mu}$		160	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-d}{}^f{}_\mu{}^\lambda D_\nu T_{A,n,cef\lambda}$	135	469
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf\mu}{}^\lambda D_\nu T_{A,n,cde\lambda}$		161	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-d}{}^f{}_\mu{}^\lambda D_\lambda T_{A,n,cef\nu}$	136	470

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf\mu}{}^{\lambda} D_\lambda T_{A,n,cde\nu}$		162	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-e}{}^{f}{}_{\mu}{}^{\lambda} D_\nu T_{A,n,cdf\lambda}$		471
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf\nu}{}^{\lambda} D_\mu T_{A,n,cde\lambda}$		163	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-e}{}^{f}{}_{\mu}{}^{\lambda} D_\lambda T_{A,n,cdf\nu}$		472
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf\nu}{}^{\lambda} D_\lambda T_{A,n,cde\mu}$		164	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} f_{-be\mu}{}^{\lambda} D_\nu T_{A,n,cdf\lambda}$		473
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,dfg\rho}$	29	165	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} f_{-be\mu}{}^{\lambda} D_\lambda T_{A,n,cdf\nu}$		474
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-c}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,efg\rho}$	30	166	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,def\rho}$	137	475
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cfg\rho}$		167	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,def\rho}$	138	476
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,dfg\rho}$		168	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cef\rho}$	139	477
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cfg\rho}$		169	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cef\rho}$	140	478
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cdg\rho}$		170	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} f_{-b}{}^{e}{}_{\mu}{}^{\lambda} D_\nu T_{A,n,cde\lambda}$	141	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf}{}^{\lambda\rho} D_{\mu\nu\lambda} T_{A,n,deg\rho}$	31	171	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} f_{-b}{}^{e}{}_{\mu}{}^{\lambda} D_\lambda T_{A,n,cde\nu}$	142	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df}{}^{\lambda\rho} D_{\mu\nu\lambda} T_{A,n,ceg\rho}$		172	$\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} f_{-b}{}^{e\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cde\rho}$	143	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef}{}^{\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cdg\rho}$		173	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdf\rho}$		479
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf}{}^{\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cde\rho}$		174	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdf\rho}$		480
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,efg\rho}$	32	175	$\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} f_{-be}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdf\rho}$		481
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,efg\rho}$	33	176	$\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} f_{-be}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdf\rho}$		482
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,dfg\rho}$	34	177	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_c{}^{f}{}_{\mu}{}^{\lambda} D_\nu T_{A,n,def\lambda}$	144	483
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,dfg\rho}$	35	178	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_c{}^{f}{}_{\mu}{}^{\lambda} D_\lambda T_{A,n,def\nu}$	145	484
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,dfg\nu}$	36	179	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_d{}^{f}{}_{\mu}{}^{\lambda} D_\nu T_{A,n,cef\lambda}$	146	485
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,dfg\rho}$	37	180	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_d{}^{f}{}_{\mu}{}^{\lambda} D_\lambda T_{A,n,cef\nu}$	147	486
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,efg\rho}$	38	181	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_e{}^{f}{}_{\mu}{}^{\lambda} D_\nu T_{A,n,cdf\lambda}$		487
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,efg\nu}$	39	182	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_e{}^{f}{}_{\mu}{}^{\lambda} D_\lambda T_{A,n,cdf\nu}$		488
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cfg\rho}$		183	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} h_{be\mu}{}^{\lambda} D_\nu T_{A,n,cdf\lambda}$		489
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cfg\rho}$		184	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} h_{be\mu}{}^{\lambda} D_\lambda T_{A,n,cdf\nu}$		490
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cfg\nu}$		185	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_c{}^{f\lambda\rho} D_{\mu\lambda\rho} T_{A,n,def\nu}$	148	491
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} f_{-e}{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,cfg\rho}$		186	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_d{}^{f\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cef\nu}$	149	492
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,dfg\rho}$		187	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_e{}^{f\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cdf\nu}$		493
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,dfg\rho}$		188	$i\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} h_{be}{}^{\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cdf\nu}$		494
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,dfg\nu}$		189	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_c{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,def\rho}$	150	495
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-c}{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,dfg\rho}$		190	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_c{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,def\rho}$	151	496
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cfg\rho}$		191	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_d{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cef\rho}$	152	497
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cfg\rho}$		192	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_d{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cef\rho}$	153	498
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cfg\nu}$		193	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_e{}^{f\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdf\rho}$		499
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-d}{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,cfg\rho}$		194	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} h_e{}^{f\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdf\rho}$		500
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdg\rho}$		195	$\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} h_{be}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdf\rho}$		501
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdg\rho}$		196	$\epsilon^{abc}\bar{B}_a{}^d f_{+}{}^{ef\mu\nu} h_{be}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdf\rho}$		502
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cdg\nu}$		197	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^{e}{}_{\mu}{}^{\nu} u_c{}^{f\lambda} D_\nu T_{A,n,def\lambda}$	154	503
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} f_{-f}{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,cdg\rho}$		198	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^{e}{}_{\mu}{}^{\nu} u_c{}^{f\lambda} D_\lambda T_{A,n,def\nu}$	155	504
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,deg\rho}$		199	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^{e}{}_{\mu}{}^{\nu} u_d{}^{f\lambda} D_\nu T_{A,n,cef\lambda}$	156	505
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,deg\rho}$	40	200	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^{e}{}_{\mu}{}^{\nu} u_d{}^{f\lambda} D_\lambda T_{A,n,cef\nu}$	157	506
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,deg\nu}$	41	201	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+\mu}{}^{\nu} u_b{}^{e\lambda} D_\nu T_{A,n,cde\lambda}$	158	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-cf}{}^{\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,deg\rho}$		202	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+\mu}{}^{\nu} u_b{}^{e\lambda} D_\lambda T_{A,n,cde\nu}$	159	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,ceg\rho}$		203	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e}{}_{\mu} D_\nu T_{A,n,cde\lambda}$	160	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,ceg\rho}$		204	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e}{}_{\nu} D_\mu T_{A,n,cde\lambda}$	161	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,ceg\nu}$		205	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e\rho} D_{\mu\nu\rho} T_{A,n,cde\lambda}$	162	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-df}{}^{\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,ceg\rho}$		206	$\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cde\rho}$	163	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdg\rho}$		207	$\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e\rho} \sigma_{\mu\nu} D_\rho T_{A,n,cde\lambda}$	164	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdg\rho}$		208	$\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{s,+}{}^{\nu\lambda} u_b{}^{e\rho} \sigma_{\mu\rho} D_\nu T_{A,n,cde\lambda}$	165	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cdg\nu}$		209	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^{e}{}_{\mu}{}^{\nu} u_e{}^{f\lambda} D_\nu T_{A,n,cdf\lambda}$		507

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-ef}{}^{\lambda\rho}\sigma_{\nu\lambda} D_\mu T_{A,n,cdg\rho}$		210	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_{+b}{}^e{}_\mu{}^\nu u_e{}^{f\lambda} D_\lambda T_{A,n,cdf\nu}$		508
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf}{}^{\lambda\rho}\sigma_{\mu\nu} D_\lambda T_{A,n,cde\rho}$		211	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_+{}^{ef}{}_\mu{}^\nu u_{be}{}^\lambda D_\nu T_{A,n,cdf\lambda}$		509
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf}{}^{\lambda\rho}\sigma_{\mu\lambda} D_\nu T_{A,n,cde\rho}$		212	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu f_+{}^{ef}{}_\mu{}^\nu u_{be}{}^\lambda D_\lambda T_{A,n,cdf\nu}$		510
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf}{}^{\lambda\rho}\sigma_{\mu\lambda} D_\rho T_{A,n,cde\nu}$		213	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu \nabla_\mu f_{+b}{}^{e\nu\lambda}\gamma_5\gamma_\nu T_{A,n,cde\lambda}$	166	511
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} f_{-gf}{}^{\lambda\rho}\sigma_{\nu\lambda} D_\mu T_{A,n,cde\rho}$		214	$i\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu \nabla^\nu f_{+b}{}^e{}_\mu{}^\lambda\gamma_5\gamma_\nu T_{A,n,cde\lambda}$	167	512
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^f{}_\mu h_e{}^{g\nu\lambda} D_\nu T_{A,n,dfg\lambda}$	42	215	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+c}{}^f{}_\mu{}^\lambda\gamma_5\gamma_\nu T_{A,n,def\lambda}$	168	513
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_d{}^g{}_\mu{}^\lambda D_\nu T_{A,n,efg\lambda}$	43	216	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+d}{}^f{}_\mu{}^\lambda\gamma_5\gamma_\nu T_{A,n,cef\lambda}$	169	514
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_d{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,efg\nu}$	44	217	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+e}{}^f{}_\mu{}^\lambda\gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		515
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^g{}_\mu{}^\lambda D_\nu T_{A,n,dfg\lambda}$	45	218	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+e}{}^f{}_\mu{}^\lambda\gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		516
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,dfg\nu}$	46	219	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+c}{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,def\rho}$	170	517
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^g{}_\nu{}^\lambda D_\mu T_{A,n,dfg\lambda}$	47	220	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+d}{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cef\rho}$	171	518
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,dfg\mu}$		221	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{s,+\mu}{}^\lambda\gamma_5\gamma_\nu T_{A,n,cde\lambda}$	172	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^f{}_\mu h_c{}^{g\nu\lambda} D_\nu T_{A,n,efg\lambda}$	48	222	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{s,+\mu}{}^\lambda\gamma_5\gamma_\lambda T_{A,n,cde\nu}$	173	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^f{}_\mu h_e{}^{g\nu\lambda} D_\nu T_{A,n,cfg\lambda}$		223	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{s,+}{}^{\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cde\rho}$	174	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cfg\lambda}$		224	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{s,+}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cde\nu}$	175	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cfg\nu}$		225	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+e}{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		519
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cfg\lambda}$		226	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} f_{+e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdf\nu}$		520
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,cfg\mu}$		227	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} f_{+c}{}^f{}_\lambda{}^\sigma D_\rho T_{A,n,def\sigma}$	176	521
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu h_c{}^{g\nu\lambda} D_\nu T_{A,n,dfg\lambda}$		228	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} f_{s,+\lambda}{}^\sigma D_\rho T_{A,n,cde\sigma}$	177	
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu h_d{}^{g\nu\lambda} D_\nu T_{A,n,cfg\lambda}$		229	$\epsilon^{\mu\nu\lambda\rho}\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^e{}_{\mu\nu} f_{+e}{}^f{}_\lambda{}^\sigma D_\rho T_{A,n,cdf\sigma}$		522
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^f{}_\mu h_f{}^{g\nu\lambda} D_\nu T_{A,n,cdg\lambda}$		230	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu}\chi_{+d}{}^g\gamma_5\gamma_\mu T_{A,n,efg\nu}$	178	523
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^g{}_\mu{}^\lambda D_\nu T_{A,n,dfg\lambda}$		231	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu}\chi_{+e}{}^g\gamma_5\gamma_\mu T_{A,n,dfg\nu}$	179	524
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,dfg\nu}$		232	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu}\chi_{+e}{}^g\gamma_5\gamma_\nu T_{A,n,dfg\mu}$	180	525
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^g{}_\nu{}^\lambda D_\mu T_{A,n,dfg\lambda}$		233	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu}\chi_{+c}{}^g\gamma_5\gamma_\mu T_{A,n,efg\nu}$	181	526
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cfg\lambda}$		234	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu}\chi_{+e}{}^g\gamma_5\gamma_\mu T_{A,n,cfg\nu}$		527
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cfg\nu}$		235	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu}\chi_{+e}{}^g\gamma_5\gamma_\nu T_{A,n,cfg\mu}$		528
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cfg\lambda}$		236	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+c}{}^g\gamma_5\gamma_\mu T_{A,n,dfg\nu}$		529
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^g{}_\mu{}^\lambda D_\nu T_{A,n,cdg\lambda}$		237	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+c}{}^g\gamma_5\gamma_\nu T_{A,n,dfg\mu}$		530
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^g{}_\mu{}^\lambda D_\lambda T_{A,n,cdg\nu}$		238	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+d}{}^g\gamma_5\gamma_\mu T_{A,n,cfg\nu}$		531
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^g{}_\nu{}^\lambda D_\mu T_{A,n,cdg\lambda}$		239	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+d}{}^g\gamma_5\gamma_\nu T_{A,n,cfg\mu}$		532
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^g{}_\nu{}^\lambda D_\lambda T_{A,n,cdg\mu}$		240	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+f}{}^g\gamma_5\gamma_\mu T_{A,n,cdg\nu}$		533
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu h_{ef}{}^{\nu\lambda} D_\nu T_{A,n,cdg\lambda}$		241	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+f}{}^g\gamma_5\gamma_\nu T_{A,n,cdg\mu}$		534
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg}{}_\mu h_{gf}{}^{\nu\lambda} D_\nu T_{A,n,cde\lambda}$		242	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+cf}\gamma_5\gamma_\mu T_{A,n,deg\nu}$	182	535
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef\mu}{}^\lambda D_\nu T_{A,n,cdg\lambda}$		243	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+cf}\gamma_5\gamma_\nu T_{A,n,deg\mu}$		536
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef\mu}{}^\lambda D_\lambda T_{A,n,cdg\nu}$		244	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+df}\gamma_5\gamma_\mu T_{A,n,ceg\nu}$		537
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_d{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,efg\nu}$	49	245	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+df}\gamma_5\gamma_\nu T_{A,n,ceg\mu}$		538
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,dfg\rho}$	50	246	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+ef}\gamma_5\gamma_\mu T_{A,n,cdg\nu}$		539
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,dfg\nu}$	51	247	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+ef}\gamma_5\gamma_\nu T_{A,n,cdg\mu}$		540
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} D_{\nu\lambda\rho} T_{A,n,dfg\mu}$		248	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+gf}\gamma_5\gamma_\mu T_{A,n,cde\nu}$		541
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_c{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,efg\rho}$	52	249	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu}\chi_{+gf}\gamma_5\gamma_\nu T_{A,n,cde\mu}$		542
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cfg\rho}$		250	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu}\chi_{+,s}\gamma_5\gamma_\mu T_{A,n,def\nu}$	183	543
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cfg\nu}$		251	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu}\chi_{+,s}\gamma_5\gamma_\mu T_{A,n,cef\nu}$	184	544
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} D_{\nu\lambda\rho} T_{A,n,cfg\mu}$		252	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+,s}\gamma_5\gamma_\mu T_{A,n,cdf\nu}$		545
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,dfg\rho}$		253	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu}\chi_{+,s}\gamma_5\gamma_\nu T_{A,n,cdf\mu}$		546
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,dfg\nu}$		254	$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu}\chi_{+c}{}^f D_\mu T_{A,n,def\nu}$	185	547
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cfg\rho}$		255	$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu}\chi_{+d}{}^f D_\mu T_{A,n,cef\nu}$	186	548
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cfg\nu}$		256	$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu}\chi_{+e}{}^f D_\mu T_{A,n,cdf\nu}$		549
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cdg\rho}$		257	$\epsilon^{abc}\bar{B}_a{}^d f_-{}^{ef\mu\nu}\chi_{+be} D_\mu T_{A,n,cdf\nu}$		550

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cdg\nu}$		258	$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{+c}{}^f D_\mu T_{A,n,def\nu}$	187	551
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} D_{\nu\lambda\rho} T_{A,n,cdg\mu}$		259	$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{+d}{}^f D_\mu T_{A,n,cef\nu}$	188	552
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef}{}^{\lambda\rho} D_{\mu\nu\lambda} T_{A,n,cdg\rho}$		260	$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{+e}{}^f D_\mu T_{A,n,cdf\nu}$		553
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef}{}^{\lambda\rho} D_{\mu\lambda\rho} T_{A,n,cdg\nu}$		261	$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} \chi_{+be} D_\mu T_{A,n,cdf\nu}$		554
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_d{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,efg\rho}$	53	262	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu \chi_{+,s} D_\mu T_{A,n,cde\nu}$	189	555
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_d{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,efg\rho}$	54	263	$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu \chi_{+,s} D_\nu T_{A,n,cde\mu}$	190	556
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,dfg\rho}$	55	264	$\epsilon^{abc}\bar{B}_a{}^d \nabla^\mu \nabla^\nu \chi_{+b}{}^e \gamma_5\gamma_\mu T_{A,n,cde\nu}$	191	557
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,dfg\rho}$	56	265	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} \chi_{+c}{}^f \gamma_5\gamma_\mu T_{A,n,def\nu}$	192	558
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,dfg\nu}$	57	266	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} \chi_{+d}{}^f \gamma_5\gamma_\mu T_{A,n,cef\nu}$	193	559
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,dfg\rho}$	58	267	$i\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu} \chi_{+b}{}^e \gamma_5\gamma_\mu T_{A,n,cde\nu}$	194	
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cfg\rho}$		268	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} \chi_{+e}{}^f \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		560
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cfg\rho}$		269	$i\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu} \chi_{+be} \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		561
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cfg\nu}$		270	$i\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu} \chi_{+,s} \gamma_5\gamma_\mu T_{A,n,cde\nu}$	195	562
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} h_e{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,cfg\rho}$		271	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} \chi_{-d}{}^g D_\mu T_{A,n,efg\nu}$	196	563
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,dfg\rho}$		272	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} \chi_{-e}{}^g D_\mu T_{A,n,dfg\nu}$	197	564
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,dfg\rho}$		273	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} \chi_{-e}{}^g D_\nu T_{A,n,dfg\mu}$	198	565
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_c{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,dfg\nu}$		274	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} \chi_{-c}{}^g D_\mu T_{A,n,efg\nu}$	199	566
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cfg\rho}$		275	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} \chi_{-e}{}^g D_\mu T_{A,n,cfg\nu}$		567
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cfg\rho}$		276	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} \chi_{-e}{}^g D_\nu T_{A,n,cfg\mu}$		568
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_d{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cfg\nu}$		277	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-c}{}^g D_\mu T_{A,n,dfg\nu}$		569
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdg\rho}$		278	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-c}{}^g D_\nu T_{A,n,dfg\mu}$		570
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdg\rho}$		279	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-d}{}^g D_\mu T_{A,n,cfg\nu}$		571
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cdg\nu}$		280	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-d}{}^g D_\nu T_{A,n,cfg\mu}$		572
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} h_f{}^{g\lambda\rho} \sigma_{\nu\lambda} D_\mu T_{A,n,cdg\rho}$		281	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-f}{}^g D_\mu T_{A,n,cdg\nu}$		573
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef}{}^{\lambda\rho} \sigma_{\mu\nu} D_\lambda T_{A,n,cdg\rho}$		282	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-f}{}^g D_\nu T_{A,n,cdg\mu}$		574
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\nu T_{A,n,cdg\rho}$		283	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-cf} D_\mu T_{A,n,deg\nu}$	200	575
$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} h_{ef}{}^{\lambda\rho} \sigma_{\mu\lambda} D_\rho T_{A,n,cdg\nu}$		284	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-cf} D_\nu T_{A,n,deg\mu}$		576
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-c}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,def\lambda}$	59	285	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-df} D_\mu T_{A,n,ceg\nu}$		577
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-d}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cef\lambda}$	60	286	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-df} D_\nu T_{A,n,ceg\mu}$		578
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-e}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		287	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-ef} D_\mu T_{A,n,cdg\nu}$		579
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-e}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		288	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-ef} D_\nu T_{A,n,cdg\mu}$		580
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,def\rho}$	61	289	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-gf} D_\mu T_{A,n,cde\nu}$		581
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho} \gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cef\rho}$	62	290	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u^{fg\nu} \chi_{-gf} D_\nu T_{A,n,cde\mu}$		582
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho} \gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		291	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_c{}^{f\nu} \chi_{-,s} D_\mu T_{A,n,def\nu}$	201	583
$\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho} \gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdf\nu}$		292	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_d{}^{f\nu} \chi_{-,s} D_\mu T_{A,n,cef\nu}$	202	584
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-c}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,def\lambda}$	63	293	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-,s} D_\mu T_{A,n,cdf\nu}$		585
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-c}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\lambda T_{A,n,def\nu}$	64	294	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} u_e{}^{f\nu} \chi_{-,s} D_\nu T_{A,n,cdf\mu}$		586
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-d}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cef\lambda}$	65	295	$i\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} \chi_{-c}{}^f \gamma_5\gamma_\mu T_{A,n,def\nu}$	203	587
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-d}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\lambda T_{A,n,cef\nu}$	66	296	$i\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} \chi_{-d}{}^f \gamma_5\gamma_\mu T_{A,n,cef\nu}$	204	588
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-e}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		297	$i\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} \chi_{-e}{}^f \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		589
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-e}{}^f{}_\mu{}^\lambda \gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		298	$i\epsilon^{abc}\bar{B}_a{}^d f_-{}^{ef\mu\nu} \chi_{-be} \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		590
$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} f_{-be\mu}{}^\lambda \gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		299	$i\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{-c}{}^f \gamma_5\gamma_\mu T_{A,n,def\nu}$	205	591
$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} f_{-be\mu}{}^\lambda \gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		300	$i\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{-d}{}^f \gamma_5\gamma_\mu T_{A,n,cef\nu}$	206	592
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,def\rho}$	67	301	$i\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{-e}{}^f \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		593
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,def\rho}$	68	302	$i\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} \chi_{-be} \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		594
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-c}{}^{f\lambda\rho} \gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,def\nu}$	69	303	$i\epsilon^{abc}\bar{B}_a{}^d f_{-b}{}^{e\mu\nu} \chi_{-,s} \gamma_5\gamma_\mu T_{A,n,cde\nu}$	207	595
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho} \gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cef\rho}$	70	304	$i\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} \chi_{-,s} \gamma_5\gamma_\mu T_{A,n,cde\nu}$	208	596
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho} \gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cef\rho}$	71	305	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu} \nabla^\nu \chi_{-c}{}^f \gamma_5\gamma_\mu T_{A,n,def\nu}$	209	597

(Table continued)

TABLE VII. *(Continued)*

$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$	$P_n^{(N_f,4)}$	$SU(2)$	$SU(3)$
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-d}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cef\nu}$	72	306	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-c}{}^f \gamma_5\gamma_\nu T_{A,n,def\mu}$	210	598
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		307	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-d}{}^f \gamma_5\gamma_\mu T_{A,n,cef\nu}$	211	599
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cdf\rho}$		308	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-d}{}^f \gamma_5\gamma_\nu T_{A,n,cef\mu}$	212	600
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} f_{-e}{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdf\nu}$		309	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-e}{}^f \gamma_5\gamma_\mu T_{A,n,cdf\nu}$		601
$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} f_{-be}{}^{\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		310	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-e}{}^f \gamma_5\gamma_\nu T_{A,n,cdf\mu}$		602
$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} f_{-be}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cdf\rho}$		311	$i\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu}\nabla^\nu \chi_{-be}\gamma_5\gamma_\mu T_{A,n,cdf\nu}$		603
$\epsilon^{abc}\bar{B}_a{}^d h^{ef\mu\nu} f_{-be}{}^{\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\rho} T_{A,n,cdf\nu}$		312	$i\epsilon^{abc}\bar{B}_a{}^d u^{ef\mu}\nabla^\nu \chi_{-be}\gamma_5\gamma_\nu T_{A,n,cdf\mu}$		604
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_c{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,def\lambda}$	73	313	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-,s}\gamma_5\gamma_\mu T_{A,n,cde\nu}$	213	605
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_d{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cef\lambda}$	74	314	$i\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla^\nu \chi_{-,s}\gamma_5\gamma_\nu T_{A,n,cde\mu}$	214	606
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_e{}^f{}_\mu{}^\lambda \gamma_5\gamma_\nu T_{A,n,cdf\lambda}$		315	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu}\chi_{-c}{}^f D_\mu T_{A,n,def\nu}$	215	607
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_e{}^f{}_\mu{}^\lambda \gamma_5\gamma_\lambda T_{A,n,cdf\nu}$		316	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu}\chi_{-d}{}^f D_\mu T_{A,n,cef\nu}$	216	608
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_c{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,def\rho}$	75	317	$\epsilon^{abc}\bar{B}_a{}^d f_{s,+}{}^{\mu\nu}\chi_{-b}{}^e D_\mu T_{A,n,cde\nu}$	217	
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_d{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cef\rho}$	76	318	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu}\chi_{-e}{}^f D_\mu T_{A,n,cdf\nu}$		609
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_e{}^{f\lambda\rho}\gamma_5\gamma_\mu D_{\nu\lambda} T_{A,n,cdf\rho}$		319	$\epsilon^{abc}\bar{B}_a{}^d f_+{}^{ef\mu\nu}\chi_{-be} D_\mu T_{A,n,cdf\nu}$		610
$\epsilon^{abc}\bar{B}_a{}^d h_b{}^{e\mu\nu} h_e{}^{f\lambda\rho}\gamma_5\gamma_\lambda D_{\mu\nu} T_{A,n,cdf\rho}$		320	$\epsilon^{abc}\bar{B}_a{}^d f_{+b}{}^{e\mu\nu}\chi_{-,s} D_\mu T_{A,n,cde\nu}$	218	611
$\epsilon^{abc}\bar{B}_a{}^d u_b{}^{e\mu}\nabla_\mu f_{-c}{}^{f\nu\lambda}\gamma_5\gamma_\nu T_{A,n,def\lambda}$	77	321			

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