# Erratum: Semisimple extensions of the Standard Model gauge algebra [Phys. Rev. D 104, 035035 (2021)]

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Algebra 32 contains the Pati-Salam algebra and so should not appear in Table I; similarly, algebras 23 and 26 are subalgebras of 22 and 7, respectively, and so should not appear in Table I. The counts of maximal and minimal algebras appearing on the second and the last pages should therefore be changed to 24 and 5, respectively. Updated Tables I and II and numberings are given below. Furthermore, updated Supplemental Material is provided.

TABLE I. All maximal and minimal anomaly-free algebras for exactly three generations of SM fermions plus three right-handed neutrinos.

| | Algebra | Fermion representations corresponding to $\beta$ |
|---|---|---|
| | **Maximal** | |
| 1 | $\mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{16},\mathbf{3})$ |
| 2 | $\mathfrak{so}(10)^{\oplus 3}$ | $(\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16})$ |
| 3 | $\mathfrak{so}(10)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16},\mathbf{2})$ |
| 4 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{6})$ |
| 5 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(6)$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{6})$ |
| 6 | $\mathfrak{su}(12) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\overline{\mathbf{12}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{12},\mathbf{1},\mathbf{2})$ |
| 7 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4)^{\oplus 2} \oplus \mathfrak{so}(10)$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{4},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{16})$ |
| 8 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 9 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 10 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 11 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 12 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 13 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 14 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 15 | $\mathfrak{su}(5)^{\oplus 3} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 16 | $\mathfrak{su}(8) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{8}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{8},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 17 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2})$ |
| 18 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2})$ |
| 19 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 20 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 21 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 22 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 23 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 24 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2})$ |
| | **Minimal** | |
| 25 | $\mathfrak{su}(5)$ | $(\bar{\mathbf{5}})^{\oplus 3} \oplus (\mathbf{10})^{\oplus 3} \oplus (\mathbf{1})^{\oplus 3}$ |
| 26 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 27 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 28 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 29 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |

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TABLE II. All algebras for exactly three generations of SM fermions plus three right-handed neutrinos which are neither maximal nor minimal.

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 30 | $\mathfrak{so}(10)$ | $(\mathbf{16})^{\oplus 3}$ |
| 31 | $\mathfrak{so}(10)^{\oplus 2}$ | $(\mathbf{16},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16})^{\oplus 2}$ |
| 32 | $\mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{16},\mathbf{1}) \oplus (\mathbf{16},\mathbf{2})$ |
| 33 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1})$ |
| 34 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 2} \oplus (\mathbf{10},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 35 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 36 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 37 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 38 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3})$ |
| 39 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1})^{\oplus 3}$ |
| 40 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 41 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 42 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3})$ |
| 43 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 44 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1})$ |
| 45 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3})$ |
| 46 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{10},\mathbf{1})^{\oplus 3}$ |
| 47 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 48 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 49 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3})$ |
| 50 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 51 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3})$ |
| 52 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 53 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1})$ |
| 54 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3})$ |
| 55 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 56 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3})$ |
| 57 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 58 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3})$ |
| 59 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1})$ |
| 60 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1})^{\oplus 3} \oplus (\mathbf{1},\mathbf{3})$ |
| 61 | $\mathfrak{su}(5)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1})^{\oplus 2} \oplus (\mathbf{10},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}}) \oplus (\mathbf{1},\mathbf{10}) \oplus (\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 62 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 63 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 64 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 65 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{11},\mathbf{1})^{\oplus 2}$ |
| 66 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 67 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 68 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 69 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 70 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 71 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 72 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 73 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 74 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 75 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 76 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 77 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 78 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3},\mathbf{1})$ |
| 79 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 80 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 81 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 82 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |

*(Table continued)*

TABLE II. *(Continued)*

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 83 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 84 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 85 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{3}) \oplus (\mathbf{1},\mathbf{3},\mathbf{1})$ |
| 86 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 87 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 88 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 89 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})$ |
| 90 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 91 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})$ |
| 92 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3},\mathbf{1})$ |
| 93 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})$ |
| 94 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 95 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 96 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 97 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 98 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 99 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 100 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{3},\mathbf{1})$ |
| 101 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 102 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 103 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})$ |
| 104 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{3},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 105 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 106 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 107 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 108 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 109 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{so}(10)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 110 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 111 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 112 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 113 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 114 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 115 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 116 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 117 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1})$ |
| 118 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 119 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 120 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{10},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 121 | $\mathfrak{su}(5)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{5}}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 122 | $\mathfrak{su}(3) \oplus \mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{3}},\bar{\mathbf{4}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{3},\mathbf{4},\mathbf{1},\mathbf{2})$ |
| 123 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 124 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2}$ |
| 125 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2}$ |
| 126 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2}$ |
| 127 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{6},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 128 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{6},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 129 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 130 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 131 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 132 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 133 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 134 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 135 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 136 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |

*(Table continued)*

TABLE II. *(Continued)*

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 137 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{3},\mathbf{1},\mathbf{2})$ |
| 138 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{3},\mathbf{1},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 139 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{3},\mathbf{1},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 140 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 141 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 142 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 143 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 144 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 3}$ |
| 145 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 146 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 147 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{4},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 148 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 149 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 150 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 151 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{2})$ |
| 152 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{4}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 153 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 154 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 155 | $\mathfrak{su}(4) \oplus \mathfrak{su}(8) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{8}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{8},\mathbf{1},\mathbf{2})$ |
| 156 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{11},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 157 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 158 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 159 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 160 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 161 | $\mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 162 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 163 | $\mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 164 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3}$ |
| 165 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 166 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 167 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 168 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{1})$ |
| 169 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 170 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 171 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 172 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 173 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 174 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{3})$ |
| 175 | $\mathfrak{su}(5)^{\oplus 3} \oplus \mathfrak{su}(2)$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 176 | $\mathfrak{su}(5) \oplus \mathfrak{su}(8) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{8}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{8},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 177 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 178 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2})$ |
| 179 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 180 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2}$ |
| 181 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2}$ |
| 182 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 183 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 184 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 185 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 186 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 187 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 188 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 189 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |

*(Table continued)*

TABLE II. *(Continued)*

| | Nonmaximal and nonminimal algebras | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 190 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 191 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 192 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 193 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 194 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 195 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 196 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{3},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 197 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{3},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 198 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 199 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{2})$ |
| 200 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 201 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 202 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 203 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 204 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 205 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 206 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 207 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 208 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 209 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 210 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 211 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 3} \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 212 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 213 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 214 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 215 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{6},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 216 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 217 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 218 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 219 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 220 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 221 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 222 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 223 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ $\oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{2})$ |
| 224 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 225 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ $\oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 226 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 227 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 228 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ $\oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 229 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ $\oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 230 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 231 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 232 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 233 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 234 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})^{\oplus 2} \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 235 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 236 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 237 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |

*(Table continued)*

TABLE II. *(Continued)*

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 238 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 239 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 240 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 241 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 242 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 243 | $\mathfrak{su}(4) \oplus \mathfrak{su}(8) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{8}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{8},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 244 | $\mathfrak{su}(4) \oplus \mathfrak{su}(8) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{8}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{8},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 245 | $\mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{5}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 246 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 247 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 248 | $\mathfrak{su}(4) \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 249 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 250 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 251 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 252 | $\mathfrak{su}(4) \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 253 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 254 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{3},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 255 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 256 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 257 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 258 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 259 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{3},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 260 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 261 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 262 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 263 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 264 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 265 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 266 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 267 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 268 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 2}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 269 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 270 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 271 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 272 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 273 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 274 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 275 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 276 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 277 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 278 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 279 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 280 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 281 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 282 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 283 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 284 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 285 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 286 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |

*(Table continued)*

TABLE II. *(Continued)*

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 287 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 288 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 289 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 290 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 291 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 292 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 293 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 294 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 295 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2}$ |
| 296 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 297 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 298 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 299 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ |
| 300 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 301 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 302 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 303 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 304 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 3}$ | $(\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 305 | $\mathfrak{su}(4) \oplus \mathfrak{su}(8) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{8}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{8},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 306 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 307 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 308 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 309 | $\mathfrak{su}(4) \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 310 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{so}(10) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{1},\mathbf{16},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 311 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 312 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 313 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 314 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{sp}(4) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 315 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 316 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 317 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 318 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 319 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 320 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 321 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 322 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |

*(Table continued)*

TABLE II. *(Continued)*

| Nonmaximal and nonminimal algebras | | |
|---|---|---|
| | Algebra | Fermion representations corresponding to $\beta$ |
| 323 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 324 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 325 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 326 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 327 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})^{\oplus 2} \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 328 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 329 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 330 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 331 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 332 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 4}$ | $(\mathbf{1},\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2}) \oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1})$ |
| 333 | $\mathfrak{su}(4) \oplus \mathfrak{su}(5) \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{5}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{10},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 334 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 335 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 336 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\mathbf{4},\mathbf{1},\mathbf{2},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 337 | $\mathfrak{su}(4)^{\oplus 2} \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 338 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 339 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 5}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |
| 340 | $\mathfrak{su}(4)^{\oplus 3} \oplus \mathfrak{su}(2)^{\oplus 6}$ | $(\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1},\mathbf{1})$ $\oplus (\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\bar{\mathbf{4}},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2},\mathbf{1}) \oplus (\mathbf{1},\mathbf{1},\mathbf{4},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{1},\mathbf{2})$ |

Separately, the algebra $\mathfrak{su}(4) \oplus \mathfrak{sp}(6) \oplus \mathfrak{sp}(6)$ had been discussed prior to the publication of this paper in Refs. [1,2].

[1] T. K. Kuo and N. Nakagawa, The generation problem and the symplectic group, Nucl. Phys. **B250**, 641 (1985).
[2] T. K. Kuo and N. Nakagawa, An $Sp_L(6) \times U_Y(1)$ extension of the electroweak theory, Phys. Rev. D **30**, 2011 (1984).