

| Fundamental field | Symmetries | Decomposition into SO(3) irrep(s) | Source |
|----------------------------------|--|--|--|
| $h_{\alpha\beta\chi}$ | Symmetry[3, $h^{\bullet 1\bullet 2\bullet 3}$, { $\bullet 1 \rightarrow -a$, $\bullet 2 \rightarrow -b$, $\bullet 3 \rightarrow -c$ }, StrongGenSet[{1, 2, 3}, GenSet[(1,2), (2,3)]]] | $h_{3^{-}\alpha\beta\chi}^{\#1} + \frac{1}{15} \eta_{\beta\chi} h_{1^{-}\alpha}^{\#2} + \frac{1}{15} \eta_{\alpha\chi} h_{1^{-}\beta}^{\#2} + \frac{1}{15} \eta_{\alpha\beta} h_{1^{-}\chi}^{\#2} + \frac{1}{9} \eta_{\beta\chi} h_{0^{+}}^{\#2} n_{\alpha} + \frac{1}{3} h_{2^{+}\beta\chi}^{\#1} n_{\alpha} +$ $\frac{1}{9} \eta_{\alpha\chi} h_{0^{+}}^{\#2} n_{\beta} + \frac{1}{3} h_{2^{+}\alpha\chi}^{\#1} n_{\beta} - \frac{1}{15} h_{1^{-}\chi}^{\#2} n_{\alpha} n_{\beta} + \frac{1}{3} h_{1^{-}\chi}^{\#1} n_{\alpha} n_{\beta} + \frac{1}{9} \eta_{\alpha\beta} h_{0^{+}}^{\#2} n_{\chi} + \frac{1}{3} h_{2^{+}\alpha\beta}^{\#1} n_{\chi} -$ $\frac{1}{15} h_{1^{-}\beta}^{\#2} n_{\alpha} n_{\chi} + \frac{1}{3} h_{1^{-}\beta}^{\#1} n_{\alpha} n_{\chi} - \frac{1}{15} h_{1^{-}\alpha}^{\#2} n_{\beta} n_{\chi} + \frac{1}{3} h_{1^{-}\alpha}^{\#1} n_{\beta} n_{\chi} - \frac{1}{3} h_{0^{+}}^{\#2} n_{\alpha} n_{\beta} n_{\chi} + h_{0^{+}}^{\#1} n_{\alpha} n_{\beta} n_{\chi}$ | $\mathcal{F}_{\alpha\beta\chi}$ |
| SO(3) irrep | Symmetries | Expansion in terms of the fundamental field | Source SO(3) irrep |
| $h_{0^{+}}^{\#1}$ | Symmetry[0, $h_{0^{+}}^{\#1}$, {}, StrongGenSet[{}], GenSet[]] | $h_{\alpha\beta\chi} n^{\alpha} n^{\beta} n^{\chi}$ | $\mathcal{F}_{0^{+}}^{\#1}$ |
| $h_{0^{+}}^{\#2}$ | Symmetry[0, $h_{0^{+}}^{\#2}$, {}, StrongGenSet[{}], GenSet[]] | $3 h_{\alpha}^{\beta}{}_{\beta} n^{\alpha} - 3 h_{\alpha\beta\chi} n^{\alpha} n^{\beta} n^{\chi}$ | $\mathcal{F}_{0^{+}}^{\#2}$ |
| $h_{1^{-}\alpha}^{\#1}$ | Symmetry[1, $h_{1^{-}}^{\#1\bullet 1}$, { $\bullet 1 \rightarrow -a$ }, StrongGenSet[{}], GenSet[]] | $3 h_{\alpha\beta\chi} n^{\beta} n^{\chi} - 3 h_{\beta\chi\delta} n_{\alpha} n^{\beta} n^{\chi} n^{\delta}$ | $\mathcal{F}_{1^{-}\alpha}^{\#1}$ |
| $h_{1^{-}\alpha}^{\#2}$ | Symmetry[1, $h_{1^{-}}^{\#2\bullet 1}$, { $\bullet 1 \rightarrow -a$ }, StrongGenSet[{}], GenSet[]] | $3 h_{\alpha}^{\beta}{}_{\beta} - 3 h_{\beta}^{\chi}{}_{\chi} n_{\alpha} n^{\beta} - 3 h_{\alpha\beta\chi} n^{\beta} n^{\chi} + 3 h_{\beta\chi\delta} n_{\alpha} n^{\beta} n^{\chi} n^{\delta}$ | $\mathcal{F}_{1^{-}\alpha}^{\#2}$ |
| $h_{2^{+}\alpha\beta}^{\#1}$ | Symmetry[2, $h_{2^{+}}^{\#1\bullet 1\bullet 2}$, { $\bullet 1 \rightarrow -a$, $\bullet 2 \rightarrow -b$ }, StrongGenSet[{1, 2}, GenSet[(1,2)]]] | $3 h_{\alpha\beta\chi} n^{\chi} - \eta_{\alpha\beta} h_{\chi}^{\delta}{}_{\delta} n^{\chi} + h_{\chi}^{\delta}{}_{\delta} n_{\alpha} n_{\beta} n^{\chi} - 3 h_{\beta\chi\delta} n_{\alpha} n^{\chi} n^{\delta} - 3 h_{\alpha\chi\delta} n_{\beta} n^{\chi} n^{\delta} + \eta_{\alpha\beta} h_{\chi\delta\epsilon} n^{\chi} n^{\delta} n^{\epsilon} + 2 h_{\chi\delta\epsilon} n_{\alpha} n_{\beta} n^{\chi} n^{\delta} n^{\epsilon}$ | $\mathcal{F}_{2^{+}\alpha\beta}^{\#1}$ |
| $h_{3^{-}\alpha\beta\chi}^{\#1}$ | Symmetry[3, $h_{3^{-}}^{\#1\bullet 1\bullet 2\bullet 3}$, { $\bullet 1 \rightarrow -a$, $\bullet 2 \rightarrow -b$, $\bullet 3 \rightarrow -c$ }, StrongGenSet[{1, 2, 3}, GenSet[(1,2), (2,3)]]] | $h_{\alpha\beta\chi} - \frac{1}{5} \eta_{\beta\chi} h_{\alpha}^{\delta}{}_{\delta} - \frac{1}{5} \eta_{\alpha\chi} h_{\beta}^{\delta}{}_{\delta} - \frac{1}{5} \eta_{\alpha\beta} h_{\chi}^{\delta}{}_{\delta} + \frac{1}{5} h_{\chi}^{\delta}{}_{\delta} n_{\alpha} n_{\beta} + \frac{1}{5} h_{\beta}^{\delta}{}_{\delta} n_{\alpha} n_{\chi} + \frac{1}{5} h_{\alpha}^{\delta}{}_{\delta} n_{\beta} n_{\chi} - h_{\beta\chi\delta} n_{\alpha} n^{\delta} + \frac{1}{5} \eta_{\beta\chi} h_{\delta}^{\epsilon}{}_{\epsilon} n_{\alpha} n^{\delta} -$ $h_{\alpha\chi\delta} n_{\beta} n^{\delta} + \frac{1}{5} \eta_{\alpha\chi} h_{\delta}^{\epsilon}{}_{\epsilon} n_{\beta} n^{\delta} - h_{\alpha\beta\delta} n_{\chi} n^{\delta} + \frac{1}{5} \eta_{\alpha\beta} h_{\delta}^{\epsilon}{}_{\epsilon} n_{\chi} n^{\delta} - \frac{3}{5} h_{\delta}^{\epsilon}{}_{\epsilon} n_{\alpha} n_{\beta} n_{\chi} n^{\delta} + \frac{1}{5} \eta_{\beta\chi} h_{\alpha\delta\epsilon} n^{\delta} n^{\epsilon} +$ $\frac{1}{5} \eta_{\alpha\chi} h_{\beta\delta\epsilon} n^{\delta} n^{\epsilon} + \frac{1}{5} \eta_{\alpha\beta} h_{\chi\delta\epsilon} n^{\delta} n^{\epsilon} + \frac{4}{5} h_{\chi\delta\epsilon} n_{\alpha} n_{\beta} n^{\delta} n^{\epsilon} + \frac{4}{5} h_{\beta\delta\epsilon} n_{\alpha} n_{\chi} n^{\delta} n^{\epsilon} + \frac{4}{5} h_{\alpha\delta\epsilon} n_{\beta} n_{\chi} n^{\delta} n^{\epsilon} -$ $\frac{1}{5} \eta_{\beta\chi} h_{\delta\epsilon\phi} n_{\alpha} n^{\delta} n^{\epsilon} n^{\phi} - \frac{1}{5} \eta_{\alpha\chi} h_{\delta\epsilon\phi} n_{\beta} n^{\delta} n^{\epsilon} n^{\phi} - \frac{1}{5} \eta_{\alpha\beta} h_{\delta\epsilon\phi} n_{\chi} n^{\delta} n^{\epsilon} n^{\phi} - \frac{2}{5} h_{\delta\epsilon\phi} n_{\alpha} n_{\beta} n_{\chi} n^{\delta} n^{\epsilon} n^{\phi}$ | $\mathcal{F}_{3^{-}\alpha\beta\chi}^{\#1}$ |