

Field kinematics

Basic conventions				
Minkowski metric tensor	Totally antisymmetric tensor	Four-momentum	Four-momentum norm	Massive rest-frame
$\eta_{\mu\nu}$	$\epsilon \eta_{\mu\nu\rho\sigma}$	k^μ	$k^2 == k_\mu \ k^\mu$	$n^\mu == \frac{k^\mu}{k}$

Fundamental fields

Fundamental field	Symmetries	Decomposition in SO(3) irreps	Source
$\omega_{\alpha\beta\chi}$	Symmetry[3, $\omega^{\bullet 1\bullet 2\bullet 3}$, { ● 1 → -a, ● 2 → -b, ● 3 → -c}, StrongGenSet[{1, 2}, GenSet[-(1,2)]]]	$-\frac{1}{2} \eta_{\beta\chi} \ \omega_{1^+ \alpha}^{\#1} + \frac{1}{2} \eta_{\alpha\chi} \ \omega_{1^+ \beta}^{\#1} + \frac{4}{3} \ \omega_{2^+ \alpha\beta\chi}^{\#1} + \frac{1}{3} \ \eta_{\beta\chi} \ \omega_{0^+}^{\#1} \ n_\alpha + \omega_{1^+ \beta\chi}^{\#1} \ n_\alpha + \omega_{2^+ \beta\chi}^{\#1} \ n_\alpha - \frac{1}{3} \ \eta_{\alpha\chi} \ \omega_{0^+}^{\#1} \ n_\beta -$ $\omega_{1^+ \alpha\chi}^{\#1} \ n_\beta - \omega_{2^+ \alpha\chi}^{\#1} \ n_\beta + \omega_{1^+ \alpha\beta}^{\#2} \ n_\chi - \frac{1}{2} \ \omega_{1^+ \beta}^{\#1} \ n_\alpha \ n_\chi - \omega_{1^+ \beta}^{\#2} \ n_\alpha \ n_\chi + \frac{1}{2} \ \omega_{1^+ \alpha}^{\#1} \ n_\beta \ n_\chi + \omega_{1^+ \alpha}^{\#2} \ n_\beta \ n_\chi - \frac{1}{6} \ \epsilon \eta_{\alpha\beta\chi\delta} \ \omega_{0^+}^{\#1} \ n^\delta$	$\sigma_{\alpha\beta\chi}$

SO(3) irreps

SO(3) irrep	Symmetries	Expansion in terms of the fundamental field	Source
$\omega_{0^+}^{\#1}$	Symmetry[0, $\omega_{0^+}^{\#1}$, {}, StrongGenSet[{}, GenSet[]]]	$\omega_\alpha^\beta \ n_\beta \ n^\alpha$	$\sigma_{0^+}^{\#1}$
$\omega_{0^+}^{\#1}$	Symmetry[0, $\omega_{0^+}^{\#1}$, {}, StrongGenSet[{}, GenSet[]]]	$-\epsilon \eta_{\alpha\beta\chi\delta} \ \omega^{\beta\chi\delta} \ n^\alpha$	$\sigma_{0^+}^{\#1}$
$\omega_{1^+ \alpha\beta}^{\#1}$	Symmetry[2, $\omega_{1^+}^{\#1\bullet 1\bullet 2}$, { ● 1 → -a, ● 2 → -b}, StrongGenSet[{1, 2}, GenSet[-(1,2)]]]	$-\frac{1}{2} \ \omega_{\alpha\chi\beta} \ n^\chi + \frac{1}{2} \ \omega_{\beta\chi\alpha} \ n^\chi - \frac{1}{2} \ \omega_{\beta\chi\delta} \ n_\alpha \ n^\chi \ n^\delta + \frac{1}{2} \ \omega_{\alpha\chi\delta} \ n_\beta \ n^\chi \ n^\delta$	$\sigma_{1^+ \alpha\beta}^{\#1}$
$\omega_{1^+ \alpha\beta}^{\#2}$	Symmetry[2, $\omega_{1^+}^{\#2\bullet 1\bullet 2}$, { ● 1 → -a, ● 2 → -b}, StrongGenSet[{1, 2}, GenSet[-(1,2)]]]	$\omega_{\alpha\beta\chi} \ n^\chi + \omega_{\beta\chi\delta} \ n_\alpha \ n^\chi \ n^\delta - \omega_{\alpha\chi\delta} \ n_\beta \ n^\chi \ n^\delta$	$\sigma_{1^+ \alpha\beta}^{\#2}$
$\omega_{1^+ \alpha}^{\#1}$	Symmetry[1, $\omega_{1^+}^{\#1\bullet 1}$, { ● 1 → -a}, StrongGenSet[{}, GenSet[]]]	$-\omega_\alpha^\beta \ n_\beta + \omega_\beta^\chi \ n_\chi \ n_\alpha \ n^\beta + \omega_{\alpha\beta\chi} \ n^\beta \ n^\chi$	$\sigma_{1^+ \alpha}^{\#1}$
$\omega_{1^+ \alpha}^{\#2}$	Symmetry[1, $\omega_{1^+}^{\#2\bullet 1}$, { ● 1 → -a}, StrongGenSet[{}, GenSet[]]]	$\omega_{\alpha\beta\chi} \ n^\beta \ n^\chi$	$\sigma_{1^+ \alpha}^{\#2}$
$\omega_{2^+ \alpha\beta}^{\#1}$	Symmetry[2, $\omega_{2^+}^{\#1\bullet 1\bullet 2}$, { ● 1 → -a, ● 2 → -b}, StrongGenSet[{1, 2}, GenSet[(1,2)]]]	$-\frac{1}{2} \ \omega_{\alpha\chi\beta} \ n^\chi - \frac{1}{2} \ \omega_{\beta\chi\alpha} \ n^\chi - \frac{1}{3} \ \eta_{\alpha\beta} \ \omega_\chi^\delta \ n^\chi + \frac{1}{3} \ \omega_\chi^\delta \ n_\alpha \ n_\beta \ n^\chi + \frac{1}{2} \ \omega_{\beta\chi\delta} \ n_\alpha \ n^\chi \ n^\delta + \frac{1}{2} \ \omega_{\alpha\chi\delta} \ n_\beta \ n^\chi \ n^\delta$	$\sigma_{2^+ \alpha\beta}^{\#1}$
$\omega_{2^+ \alpha\beta\chi}^{\#1}$	Symmetry[3, $\omega_{2^+}^{\#1\bullet 1\bullet 2\bullet 3}$, { ● 1 → -a, ● 2 → -b, ● 3 → -c}, StrongGenSet[{1, 2}, GenSet[-(1,2)]]]	$\frac{1}{2} \ \omega_{\alpha\beta\chi} + \frac{1}{4} \ \omega_{\alpha\chi\beta} - \frac{3}{8} \ \eta_{\beta\chi} \ \omega_\alpha^\delta - \frac{1}{4} \ \omega_{\beta\chi\alpha} + \frac{3}{8} \ \eta_{\alpha\chi} \ \omega_\beta^\delta - \frac{3}{8} \ \omega_\beta^\delta \ n_\alpha \ n_\chi + \frac{3}{8} \ \omega_\alpha^\delta \ n_\beta \ n_\chi + \frac{1}{4} \ \omega_{\beta\chi\delta} \ n_\alpha \ n^\delta +$ $\frac{1}{2} \ \omega_{\beta\delta\chi} \ n_\alpha \ n^\delta + \frac{1}{4} \ \omega_{\chi\delta\beta} \ n_\alpha \ n^\delta + \frac{3}{8} \ \eta_{\beta\chi} \ \omega_\delta^\epsilon \ n_\alpha \ n^\delta - \frac{1}{4} \ \omega_{\alpha\chi\delta} \ n_\beta \ n^\delta - \frac{1}{2} \ \omega_{\alpha\delta\chi} \ n_\beta \ n^\delta - \frac{1}{4} \ \omega_{\chi\delta\alpha} \ n_\beta \ n^\delta - \frac{3}{8} \ \eta_{\alpha\chi} \ \omega_\delta^\epsilon \ n_\beta \ n^\delta -$ $\frac{1}{2} \ \omega_{\alpha\beta\delta} \ n_\chi \ n^\delta - \frac{1}{4} \ \omega_{\alpha\delta\beta} \ n_\chi \ n^\delta + \frac{1}{4} \ \omega_{\beta\delta\alpha} \ n_\chi \ n^\delta + \frac{3}{8} \ \eta_{\beta\chi} \ \omega_{\alpha\delta\epsilon} \ n^\delta \ n^\epsilon - \frac{3}{8} \ \eta_{\alpha\chi} \ \omega_{\beta\delta\epsilon} \ n^\delta \ n^\epsilon - \frac{3}{8} \ \omega_{\beta\delta\epsilon} \ n_\alpha \ n_\chi \ n^\delta \ n^\epsilon + \frac{3}{8} \ \omega_{\alpha\delta\epsilon} \ n_\beta \ n_\chi \ n^\delta \ n^\epsilon$	$\sigma_{2^+ \alpha\beta\chi}^{\#1}$