

# Field kinematics

Momentum	Norm	Frame
$k^\mu$	$k^2 == k_\mu k^\mu$	$n^\mu == \frac{k^\mu}{k}$

## Fundamental fields

Fundamental field	Symmetries	Decomposition in SO(3) irreps	Source
$\omega_{\alpha\beta\chi}$	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 fundamental field	Source
$\omega_{0^+}^{\#1}$	StrongGenSet[{}], GenSet[]	$\omega_\alpha^\beta n_\beta n^\alpha$	$\sigma_{0^+}^{\#1}$
$\omega_{0^-}^{\#1}$	StrongGenSet[{}], GenSet[]	$-\epsilon \eta_{\alpha\beta\chi\delta} \omega^{\beta\chi\delta} n^\alpha$	$\sigma_{0^-}^{\#1}$
$\omega_{1^+ \alpha\beta}^{\#1}$	StrongGenSet[{1, 2}, GenSet[-(1,2)]]	$-\frac{1}{2} \omega_{\alpha\chi\beta} n^\chi + \frac{1}{2} \omega_{\beta\chi\alpha} n^\chi - \frac{1}{2} \omega_{\beta\chi\delta} n_\alpha n^\chi n^\delta + \frac{1}{2} \omega_{\alpha\chi\delta} n_\beta n^\chi n^\delta$	$\sigma_{1^+ \alpha\beta}^{\#1}$
$\omega_{1^+ \alpha\beta}^{\#2}$	StrongGenSet[{1, 2}, GenSet[-(1,2)]]	$\omega_{\alpha\beta\chi} n^\chi + \omega_{\beta\chi\delta} n_\alpha n^\chi n^\delta - \omega_{\alpha\chi\delta} n_\beta n^\chi n^\delta$	$\sigma_{1^+ \alpha\beta}^{\#2}$
$\omega_{1^- \alpha}^{\#1}$	StrongGenSet[{}], GenSet[]	$-\omega_\alpha^\beta n_\beta + \omega_\beta^\chi n_\chi n^\beta + \omega_{\alpha\beta\chi} n^\beta n^\chi$	$\sigma_{1^- \alpha}^{\#1}$
$\omega_{1^- \alpha}^{\#2}$	StrongGenSet[{}], GenSet[]	$\omega_{\alpha\beta\chi} n^\beta n^\chi$	$\sigma_{1^- \alpha}^{\#2}$
$\omega_{2^+ \alpha\beta}^{\#1}$	StrongGenSet[{1, 2}, GenSet[(1,2)]]	$-\frac{1}{2} \omega_{\alpha\chi\beta} n^\chi - \frac{1}{2} \omega_{\beta\chi\alpha} n^\chi - \frac{1}{3} \eta_{\alpha\beta} \omega_\chi^\delta n^\chi +$ $\frac{1}{3} \omega_\chi^\delta n_\alpha n_\beta n^\chi + \frac{1}{2} \omega_{\beta\chi\delta} n_\alpha n^\chi n^\delta + \frac{1}{2} \omega_{\alpha\chi\delta} n_\beta n^\chi n^\delta$	$\sigma_{2^+ \alpha\beta}^{\#1}$
$\omega_{2^- \alpha\beta\chi}^{\#1}$	StrongGenSet[{1, 2}, GenSet[-(1,2)]]	$\frac{1}{2} \omega_{\alpha\beta\chi} + \frac{1}{4} \omega_{\alpha\chi\beta} - \frac{3}{8} \eta_{\beta\chi} \omega_\alpha^\delta - \frac{1}{4} \omega_{\beta\chi\alpha} + \frac{3}{8} \eta_{\alpha\chi} \omega_\beta^\delta -$ $\frac{3}{8} \omega_\beta^\delta n_\alpha n_\chi + \frac{3}{8} \omega_\alpha^\delta n_\beta n_\chi + \frac{1}{4} \omega_{\beta\chi\delta} n_\alpha n^\delta + \frac{1}{2} \omega_{\beta\delta\chi} n_\alpha n^\delta +$ $\frac{1}{4} \omega_{\chi\delta\beta} n_\alpha n^\delta + \frac{3}{8} \eta_{\beta\chi} \omega_\delta^\epsilon n_\alpha n^\delta - \frac{1}{4} \omega_{\alpha\chi\delta} n_\beta n^\delta -$ $\frac{1}{2} \omega_{\alpha\delta\chi} n_\beta n^\delta - \frac{1}{4} \omega_{\chi\delta\alpha} n_\beta n^\delta - \frac{3}{8} \eta_{\alpha\chi} \omega_\delta^\epsilon n_\beta n^\delta - \frac{1}{2} \omega_{\alpha\beta\delta} n_\chi n^\delta -$ $\frac{1}{4} \omega_{\alpha\delta\beta} n_\chi n^\delta + \frac{1}{4} \omega_{\beta\delta\alpha} n_\chi n^\delta + \frac{3}{8} \eta_{\beta\chi} \omega_{\alpha\delta\epsilon} n^\delta n^\epsilon -$ $\frac{3}{8} \eta_{\alpha\chi} \omega_{\beta\delta\epsilon} n^\delta n^\epsilon - \frac{3}{8} \omega_{\beta\delta\epsilon} n_\alpha n_\chi n^\delta n^\epsilon + \frac{3}{8} \omega_{\alpha\delta\epsilon} n_\beta n_\chi n^\delta n^\epsilon$	$\sigma_{2^- \alpha\beta\chi}^{\#1}$