

Lagrangian density

$$\begin{aligned}
 & -r_5 \partial_\mu \omega_\kappa^{\kappa\lambda} \partial'_\lambda \omega_\alpha^\alpha - \frac{2}{3} r_1 \partial^\beta \omega_\kappa^{\theta\alpha} \partial_\theta \omega_{\alpha\beta}^\kappa - \\
 & \frac{2}{3} r_1 \partial_\theta \omega_{\alpha\beta}^\kappa \partial_\kappa \omega^{\alpha\beta\theta} + \frac{2}{3} r_1 \partial_\theta \omega_{\alpha\beta}^\kappa \partial_\kappa \omega^{\theta\alpha\beta} - r_5 \partial_\alpha \omega_\lambda^\alpha \partial_\theta \omega^{\theta\kappa\lambda} + \\
 & r_5 \partial_\theta \omega_\lambda^\alpha \partial_\alpha \omega_\lambda^{\theta\kappa\lambda} - r_5 \partial_\alpha \omega_\lambda^\alpha \partial_\theta \omega^{\kappa\lambda\theta} + 2 r_5 \partial_\theta \omega_\lambda^\alpha \partial_\alpha \omega^{\kappa\lambda\theta} + \\
 & \frac{2}{3} r_1 \partial_\kappa \omega_{\alpha\beta\theta}^\kappa \partial^\kappa \omega_{\alpha\beta\theta}^\kappa - \frac{2}{3} r_1 \partial_\kappa \omega^{\theta\alpha\beta} \partial^\kappa \omega_{\alpha\beta\theta}^\kappa + \frac{2}{3} r_1 \partial^\beta \omega_{\alpha\beta}^\lambda \partial_\lambda \omega_{\alpha\beta}^{\prime\prime} - \\
 & \frac{8}{3} r_1 \partial^\beta \omega_{\alpha\beta}^\lambda \partial_\lambda \omega_{\alpha\beta}^{\prime\prime} + r_5 \partial_\alpha \omega_\lambda^\alpha \partial_\theta \omega^{\theta\kappa} \partial^\lambda \omega_\lambda^\alpha \partial_\alpha \omega^{\lambda\theta\kappa}
 \end{aligned}$$

Added source term: $\omega^{\alpha\beta\chi} \sigma_{\alpha\beta\chi}$

$$\begin{array}{c} \omega_{0+}^{\#1} \end{array}
 \begin{array}{c} \omega_{0-}^{\#1} \end{array}
 \begin{array}{cc}
 \begin{array}{c} \uparrow \\ \omega_{0+}^{\#1} \end{array} & \begin{array}{c} \uparrow \\ \omega_{0-}^{\#1} \end{array} \\
 \begin{array}{|c|c|} \hline 0 & 0 \\ \hline 0 & 0 \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{c} \sigma_{0+}^{\#1} \end{array}
 \begin{array}{c} \sigma_{0-}^{\#1} \end{array}
 \begin{array}{cc}
 \begin{array}{c} \uparrow \\ \sigma_{0+}^{\#1} \end{array} & \begin{array}{c} \uparrow \\ \sigma_{0-}^{\#1} \end{array} \\
 \begin{array}{|c|c|} \hline 0 & 0 \\ \hline 0 & 0 \\ \hline \end{array}
 \end{array}$$

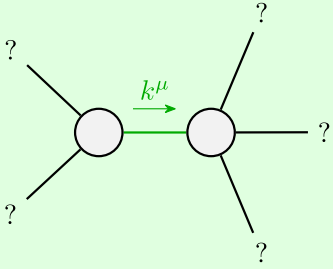
$$\begin{array}{c} \omega_{2+}^{\#1} \end{array}
 \begin{array}{c} \omega_{2-}^{\#1} \end{array}
 \begin{array}{cc}
 \begin{array}{c} \uparrow^{\alpha\beta} \\ \omega_{2+}^{\#1} \end{array} & \begin{array}{c} \uparrow^{\alpha\beta\chi} \\ \omega_{2-}^{\#1} \end{array} \\
 \begin{array}{|c|c|} \hline 0 & 0 \\ \hline 0 & k^2 r_1 \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{c} \sigma_{1+}^{\#1} \end{array}
 \begin{array}{c} \sigma_{1+}^{\#2} \end{array}
 \begin{array}{c} \sigma_{1-}^{\#1} \end{array}
 \begin{array}{c} \sigma_{1-}^{\#2} \end{array}
 \begin{array}{cc}
 \begin{array}{c} \uparrow^{\alpha\beta} \\ \sigma_{1+}^{\#1} \end{array} & \begin{array}{c} \uparrow^{\alpha\beta} \\ \sigma_{1+}^{\#2} \end{array} \\
 \begin{array}{|c|c|c|c|} \hline \frac{1}{k^2 (2r_1 + r_5)} & 0 & 0 & 0 \\ \hline 0 & 0 & 0 & 0 \\ \hline 0 & 0 & \frac{1}{k^2 (r_1 + r_5)} & 0 \\ \hline 0 & 0 & 0 & 0 \\ \hline \end{array}
 \end{array}$$

$$\begin{array}{c} \sigma_{2+}^{\#1} \end{array}
 \begin{array}{c} \sigma_{2-}^{\#1} \end{array}
 \begin{array}{cc}
 \begin{array}{c} \uparrow^{\alpha\beta} \\ \sigma_{2+}^{\#1} \end{array} & \begin{array}{c} \uparrow^{\alpha\beta\chi} \\ \sigma_{2-}^{\#1} \end{array} \\
 \begin{array}{|c|c|} \hline 0 & 0 \\ \hline 0 & \frac{1}{k^2 r_1} \\ \hline \end{array}
 \end{array}$$

Source constraints

SO(3) irreps	#
$\sigma_{0-}^{\#1} == 0$	1
$\sigma_{0+}^{\#1} == 0$	1
$\sigma_{1-}^{\#2\alpha} == 0$	3
$\sigma_{1+}^{\#2\alpha\beta} == 0$	3
$\sigma_{2+}^{\#1\alpha\beta} == 0$	5
Total #:	13



Quadratic pole

Pole residue:	$-\frac{1}{r_1 (r_1 + r_5) (2r_1 + r_5)} > 0$
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Polarisations:	2
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Unitarity conditions

$$r_1 < 0 \&\& (r_5 < -r_1 \parallel r_5 > -2r_1) \parallel r_1 > 0 \&\& -2r_1 < r_5 < -r_1$$

(No massive particles)