

## Lagrangian density

$$\begin{aligned}
 & -\frac{1}{2} r_3 \partial_i \omega^{\kappa\lambda}{}_{\kappa} \partial' \omega_{\lambda}{}^{\alpha}{}_{\alpha} - r_5 \partial_i \omega^{\kappa\lambda}{}_{\kappa} \partial' \omega_{\lambda}{}^{\alpha}{}_{\alpha} + \\
 & \frac{2}{3} r_2 \partial^{\beta} \omega^{\theta\alpha}{}_{\kappa} \partial_{\theta} \omega_{\alpha\beta}{}^{\kappa} - \frac{1}{3} r_2 \partial_{\theta} \omega_{\alpha\beta}{}^{\kappa} \partial_{\kappa} \omega^{\alpha\beta\theta} - \\
 & \frac{2}{3} r_2 \partial_{\theta} \omega_{\alpha\beta}{}^{\kappa} \partial_{\kappa} \omega^{\theta\alpha\beta} + \frac{1}{2} r_3 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial_{\kappa} \omega^{\theta\kappa\lambda} - r_5 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial_{\kappa} \omega^{\theta\kappa\lambda} - \\
 & \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} + r_5 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial_{\kappa} \omega^{\theta\kappa\lambda} - \frac{1}{2} r_3 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial_{\kappa} \omega^{\kappa\lambda\theta} - \\
 & r_5 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial_{\kappa} \omega^{\kappa\lambda\theta} + r_3 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + 2 r_5 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial_{\kappa} \omega^{\kappa\lambda\theta} + \\
 & \frac{1}{3} r_2 \partial_{\kappa} \omega^{\alpha\beta\theta} \partial^{\kappa} \omega_{\alpha\beta\theta} + \frac{2}{3} r_2 \partial_{\kappa} \omega^{\theta\alpha\beta} \partial^{\kappa} \omega_{\alpha\beta\theta} - \frac{2}{3} r_2 \partial^{\beta} \omega_{\lambda}{}^{\alpha\lambda} \partial_{\lambda} \omega_{\alpha\beta}{}^{\prime} + \\
 & \frac{2}{3} r_2 \partial^{\beta} \omega_{\lambda}{}^{\lambda\alpha} \partial_{\lambda} \omega_{\alpha\beta}{}^{\prime} - 4 r_3 \partial^{\beta} \omega_{\lambda}{}^{\lambda\alpha} \partial_{\lambda} \omega_{\alpha\beta}{}^{\prime} - \frac{1}{2} r_3 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial^{\lambda} \omega^{\theta\kappa}{}_{\kappa} + \\
 & r_5 \partial_{\alpha} \omega_{\lambda}{}^{\alpha}{}_{\theta} \partial^{\lambda} \omega^{\theta\kappa}{}_{\kappa} + \frac{1}{2} r_3 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial^{\lambda} \omega^{\theta\kappa}{}_{\kappa} - r_5 \partial_{\theta} \omega_{\lambda}{}^{\alpha}{}_{\alpha} \partial^{\lambda} \omega^{\theta\kappa}{}_{\kappa}
 \end{aligned}$$

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

Source constraints	
SO(3) irreps	#
$\sigma_{0+}^{\#1} == 0$	1
$\sigma_{1-}^{\#2\alpha} == 0$	3
$\sigma_{1+}^{\#2\alpha\beta} == 0$	3
$\sigma_{2-}^{\#1\alpha\beta\chi} == 0$	5
Total #:	12

	$\omega_{2+}^{\#1\alpha\beta}$	$\omega_{2-}^{\#1\alpha\beta\chi}$
$\omega_{2+}^{\#1\alpha\beta}$	$-\frac{3k^2 r_3}{2}$	0
$\omega_{2-}^{\#1\alpha\beta\chi}$	0	0

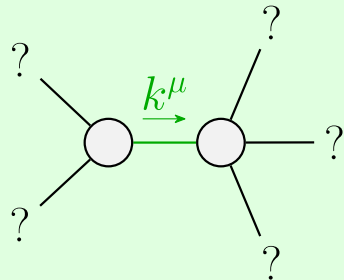
	$\sigma_{2+}^{\#1\alpha\beta}$	$\sigma_{2-}^{\#1\alpha\beta\chi}$
$\sigma_{2+}^{\#1\alpha\beta}$	$-\frac{2}{3k^2 r_3}$	0
$\sigma_{2-}^{\#1\alpha\beta\chi}$	0	0

	$\omega_{0+}^{\#1}$	$\omega_{0-}^{\#1}$
$\omega_{0+}^{\#1}$	0	0
$\omega_{0-}^{\#1}$	0	$k^2 r_2$

	$\sigma_{1+}^{\#1\alpha\beta}$	$\sigma_{1+}^{\#2\alpha\beta}$	$\sigma_{1-}^{\#1\alpha}$	$\sigma_{1-}^{\#2\alpha}$
$\sigma_{1+}^{\#1\alpha\beta}$	$\frac{1}{k^2 (2r_3 + r_5)}$	0	0	0
$\sigma_{1+}^{\#2\alpha\beta}$	0	0	0	0
$\sigma_{1-}^{\#1\alpha}$	0	0	$\frac{k^2 (r_3 + 2r_5)}{2}$	0
$\sigma_{1-}^{\#2\alpha}$	0	0	0	0

	$\omega_{1+}^{\#1\alpha\beta}$	$\omega_{1+}^{\#2\alpha\beta}$	$\omega_{1-}^{\#1\alpha}$	$\omega_{1-}^{\#2\alpha}$
$\omega_{1+}^{\#1\alpha\beta}$	$k^2 (2r_3 + r_5)$	0	0	0
$\omega_{1+}^{\#2\alpha\beta}$	0	0	0	0
$\omega_{1-}^{\#1\alpha}$	0	0	$\frac{1}{2} k^2 (r_3 + 2r_5)$	0
$\omega_{1-}^{\#2\alpha}$	0	0	0	0

	$\sigma_{0+}^{\#1}$	$\sigma_{0-}^{\#1}$
$\sigma_{0+}^{\#1}$	0	0
$\sigma_{0-}^{\#1}$	0	$\frac{1}{k^2 r_2}$



Quadratic pole

Pole residue:  $-\frac{1}{r_3 (2r_3 + r_5) (r_3 + 2r_5)} > 0$

Polarisations: 2

Unitarity conditions

$$r_3 < 0 \ \&\& \ (r_5 < -\frac{r_3}{2} \parallel r_5 > -2r_3) \parallel r_3 > 0 \ \&\& \ -2r_3 < r_5 < -\frac{r_3}{2}$$

(No massive particles)