

## Lagrangian density

$$-r_5 \partial'_i \omega^{\kappa\lambda}_{\kappa} \partial'_i \omega^{\alpha}_{\lambda \alpha} - \frac{2}{3} r_1 \partial^\beta \omega^{\theta\alpha}_{\kappa} \partial_\theta \omega^{\kappa}_{\alpha\beta} -$$

$$\frac{2}{3} r_1 \partial_\theta \omega^{\kappa}_{\alpha\beta} \partial_\kappa \omega^{\alpha\beta\theta} + \frac{2}{3} r_1 \partial_\theta \omega^{\kappa}_{\alpha\beta} \partial_\kappa \omega^{\theta\alpha\beta} - r_5 \partial_\alpha \omega^{\alpha}_{\lambda \theta} \partial_\kappa \omega^{\theta\kappa\lambda} +$$

$$r_5 \partial_\theta \omega^{\alpha}_{\lambda \alpha} \partial_\kappa \omega^{\theta\kappa\lambda} - r_5 \partial_\alpha \omega^{\alpha}_{\lambda \theta} \partial_\kappa \omega^{\kappa\lambda\theta} + 2 r_5 \partial_\theta \omega^{\alpha}_{\lambda \alpha} \partial_\kappa \omega^{\kappa\lambda\theta} +$$

$$\frac{2}{3} r_1 \partial_\kappa \omega^{\alpha\beta\theta} \partial^\kappa \omega_{\alpha\beta\theta} - \frac{2}{3} r_1 \partial_\kappa \omega^{\theta\alpha\beta} \partial^\kappa \omega_{\alpha\beta\theta} + \frac{2}{3} r_1 \partial^\beta \omega^{\alpha\lambda}_{\lambda} \partial_\lambda \omega^{\alpha\beta}_{\beta} -$$

$$\frac{8}{3} r_1 \partial^\beta \omega^{\lambda\alpha}_{\lambda} \partial_\lambda \omega^{\alpha\beta}_{\beta} + r_5 \partial_\alpha \omega^{\alpha}_{\lambda \theta} \partial^\lambda \omega^{\theta\kappa}_{\kappa} - r_5 \partial_\theta \omega^{\alpha}_{\lambda \alpha} \partial^\lambda \omega^{\theta\kappa}_{\kappa}$$

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

Source constraints	SO(3) irreps	#
$\sigma_0^{\#1} = 0$	$\sigma_0^{\#1}$	1
$\sigma_0^{\#1} = 0$	$\sigma_0^{\#1}$	1
$\sigma_1^{\#2\alpha} = 0$	$\sigma_1^{\#2\alpha}$	3
$\sigma_1^{\#2\alpha\beta} = 0$	$\sigma_1^{\#2\alpha\beta}$	3
$\sigma_2^{\#1\alpha\beta} = 0$	$\sigma_2^{\#1\alpha\beta}$	5
Total #:		13

	$\sigma_{2+}^{\#1\alpha\beta}$	$\sigma_{2-}^{\#1\alpha\beta\chi}$
$\sigma_{2+}^{\#1\alpha\beta}$	0	0
$\sigma_{2-}^{\#1\alpha\beta\chi}$	0	$\frac{1}{k^2 r_1}$

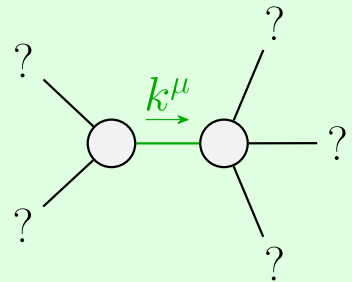
	$\omega_{2+}^{\#1\alpha\beta}$	$\omega_{2-}^{\#1\alpha\beta\chi}$
$\omega_{2+}^{\#1\alpha\beta}$	0	0
$\omega_{2-}^{\#1\alpha\beta\chi}$	0	$k^2 r_1$

	$\omega_0^{\#1+}$	$\omega_0^{\#1-}$
$\omega_0^{\#1+}$	0	0
$\omega_0^{\#1-}$	0	0

	$\sigma_0^{\#1+}$	$\sigma_0^{\#1-}$
$\sigma_0^{\#1+}$	0	0
$\sigma_0^{\#1-}$	0	0

	$\omega_{1+}^{\#1\alpha\beta}$	$\omega_{1+}^{\#2\alpha\beta}$	$\omega_{1-}^{\#1\alpha}$	$\omega_{1-}^{\#2\alpha}$
$\omega_{1+}^{\#1\alpha\beta}$	$k^2 (2r_1 + r_5)$	0	0	0
$\omega_{1+}^{\#2\alpha\beta}$	0	0	0	0
$\omega_{1-}^{\#1\alpha}$	0	0	$k^2 (r_1 + r_5)$	0
$\omega_{1-}^{\#2\alpha}$	0	0	0	0

	$\sigma_{1-}^{\#2\alpha}$	$\sigma_{1-}^{\#1\alpha}$	$\sigma_{1+}^{\#2\alpha\beta}$	$\sigma_{1+}^{\#1\alpha\beta}$
$\sigma_{1-}^{\#2\alpha}$	0	0	0	$\frac{k^2}{(2r_1 + r_5)}$
$\sigma_{1-}^{\#1\alpha}$	0	0	0	0
$\sigma_{1+}^{\#2\alpha\beta}$	0	0	0	0
$\sigma_{1+}^{\#1\alpha\beta}$	0	0	0	0



Quadratic pole

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

Polarisations: 2

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)