## Lagrangian density

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

## Added source term:

$$\omega^{\alpha\beta\chi}\;\sigma_{\alpha\beta\chi}$$

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

## 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 |

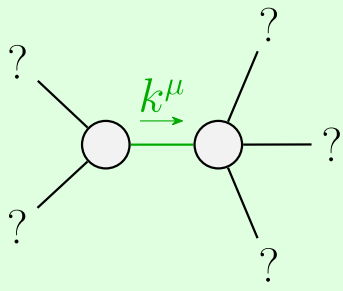
| | $\omega_{0^+}^{\#1}$ | $\omega_{0^-}^{\#1}$ |
|---|---|---|
| $\omega_{0^+}^{\#1}\,\dagger$ | 0 | 0 |
| $\omega_{0^-}^{\#1}\,\dagger$ | 0 | 0 |

| | $\sigma_{0^+}^{\#1}$ | $\sigma_{0^-}^{\#1}$ |
|---|---|---|
| $\sigma_{0^+}^{\#1}\,\dagger$ | 0 | 0 |
| $\sigma_{0^-}^{\#1}\,\dagger$ | 0 | 0 |

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

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

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




## Quadratic pole

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

## Unitarity conditions

$$r_1 < 0\;\&\&\;(r_5 < -r_1\;||\;r_5 > -2\,r_1)\;\|\;r_1 > 0\;\&\&\;-2\,r_1 < r_5 < -r_1$$

(No massive particles)