## Lagrangian density

$$-r_5\,\partial_\iota\omega^{\kappa\lambda}{}_\kappa\,\partial^\iota\omega_\lambda{}^\alpha{}_\alpha-\frac{2}{3}\,r_1\,\partial^\beta\omega^{\theta\alpha}{}_\kappa\,\partial_\theta\omega_{\alpha\beta}{}^\kappa-$$
$$\frac{2}{3}\,r_1\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\alpha\beta\theta}+\frac{2}{3}\,r_1\,\partial_\theta\omega_{\alpha\beta}{}^\kappa\,\partial_\kappa\omega^{\theta\alpha\beta}-r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\theta\kappa\lambda}+$$
$$r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\theta\kappa\lambda}-r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial_\kappa\omega^{\kappa\lambda\theta}+2\,r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial_\kappa\omega^{\kappa\lambda\theta}+$$
$$\frac{2}{3}\,r_1\,\partial_\kappa\omega^{\alpha\beta\theta}\,\partial^\kappa\omega_{\alpha\beta\theta}-\frac{2}{3}\,r_1\,\partial_\kappa\omega^{\theta\alpha\beta}\,\partial^\kappa\omega_{\alpha\beta\theta}+\frac{2}{3}\,r_1\,\partial^\beta\omega_\iota{}^{\alpha\lambda}\,\partial_\lambda\omega_{\alpha\beta}{}^\iota-$$
$$\frac{8}{3}\,r_1\,\partial^\beta\omega_\iota{}^{\lambda\alpha}\,\partial_\lambda\omega_{\alpha\beta}{}^\iota+r_5\,\partial_\alpha\omega_\lambda{}^\alpha{}_\theta\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa-r_5\,\partial_\theta\omega_\lambda{}^\alpha{}_\alpha\,\partial^\lambda\omega^{\theta\kappa}{}_\kappa$$

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

| Source constraints | SO(3) irreps # | Total #: |
|---|---|---|
| $\sigma_{0^-}^{\#1}==0$ | 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 | 13 |

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

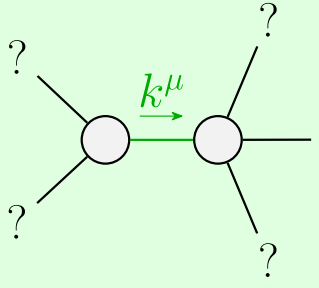
| | $\omega_{0^+}^{\#1}$ | $\omega_{0^-}^{\#1}$ |
|---|---|---|
| $\omega_{0^+}^{\#1}\,\dagger$ | 0 | 0 |
| $\omega_{0^-}^{\#1}\,\dagger$ | 0 | 0 |

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

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

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




## 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)