## Lagrangian density

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

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

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

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

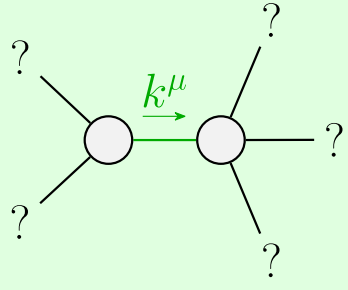
| | $\sigma_{0^+}^{\#1}$ |
|---|---|
| $\sigma_{0^-}^{\#1\,\dagger}$ | 0 |
| $\sigma_{0^+}^{\#1\,\dagger}$ | 0 |

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

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

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