

Lagrangian density

$$\beta \partial_\alpha \phi \partial^\alpha \phi + \frac{1}{2} \alpha \partial_\beta h^\chi_\chi \partial^\beta h^\alpha_\alpha + \alpha \partial_\alpha h^{\alpha\beta} \partial_\chi h^\chi_\beta - \alpha \partial^\beta h^\alpha_\alpha \partial_\chi h^\chi_\beta - \frac{1}{2} \alpha \partial_\chi h_{\alpha\beta} \partial^\chi h^{\alpha\beta}$$

Added source term: $\phi \rho + h^{\alpha\beta} \mathcal{T}_{\alpha\beta}$

| Source constraints | | |
|-------------------------------------|---|--|
| SO(3) irreps | # | |
| $\mathcal{T}_{0+}^{\#2} == 0$ | 1 | |
| $\mathcal{T}_{1-}^{\#1\alpha} == 0$ | 3 | |
| Total #: | 4 | |

| | $h_{0+}^{\#1}$ | $h_{0+}^{\#2}$ | $\phi_{0+}^{\#1}$ |
|---------------------------|----------------|----------------|-------------------|
| $h_{0+}^{\#1} \dagger$ | αk^2 | 0 | 0 |
| $h_{0+}^{\#2} \dagger$ | 0 | 0 | 0 |
| $\phi_{0+}^{\#1} \dagger$ | 0 | 0 | βk^2 |

| | $\mathcal{T}_{0+}^{\#1}$ | $\mathcal{T}_{0+}^{\#2}$ | $\rho_{0+}^{\#1}$ |
|----------------------------------|--------------------------|--------------------------|-----------------------|
| $\mathcal{T}_{0+}^{\#1} \dagger$ | $\frac{1}{\alpha k^2}$ | 0 | 0 |
| $\mathcal{T}_{0+}^{\#2} \dagger$ | 0 | 0 | 0 |
| $\rho_{0+}^{\#1} \dagger$ | 0 | 0 | $\frac{1}{\beta k^2}$ |

$$\mathcal{T}_{2+}^{\#1\alpha\beta}$$

$$\mathcal{T}_{2+}^{\#1} \dagger^{\alpha\beta} \quad \boxed{-\frac{2}{\alpha k^2}}$$

$$h_{2+}^{\#1\alpha\beta}$$

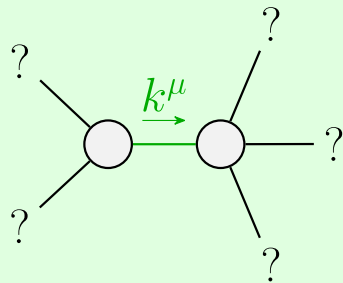
$$h_{2+}^{\#1} \dagger^{\alpha\beta} \quad \boxed{-\frac{\alpha k^2}{2}}$$

$$\mathcal{T}_{1-}^{\#1\alpha}$$

$$\mathcal{T}_{1-}^{\#1} \dagger^\alpha \quad \boxed{0}$$

$$h_{1-}^{\#1\alpha}$$

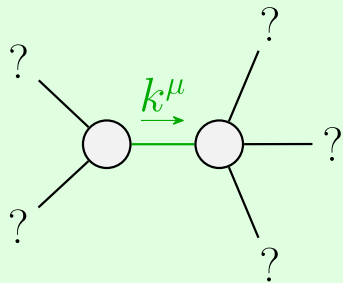
$$h_{1-}^{\#1} \dagger^\alpha \quad \boxed{0}$$



Quadratic pole

Pole residue: $-\frac{1}{\alpha} > 0$

Polarisations: 2



Quadratic pole

Pole residue: $\frac{1}{\beta} > 0$

Polarisations: 1

Unitarity conditions
 $\alpha < 0 \ \& \ \beta > 0$

(No massive particles)