

Lagrangian density

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

Added source term:

$$h^{\alpha\beta} \mathcal{T}_{\alpha\beta}$$

(No source constraints)

$$h^{\#1}_{0^+} \dagger$$

$$h^{\#2}_{0^+} \dagger$$

$$\alpha k^2$$

$$0$$

$$h^{\#1}_{0^+} \dagger$$

$$h^{\#2}_{0^+} \dagger$$

$$0$$

$$(-\alpha + \beta) k^2$$

$$h^{\#1}_{1^+} \dagger$$

$$h^{\#1}_{1^+} \dagger$$

$$\frac{1}{2}$$

$$\frac{1}{2}$$

$$h^{\#1}_{1^+} \dagger$$

$$h^{\#1}_{1^+} \dagger$$

$$\frac{1}{2}$$

$$\frac{1}{2}$$

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

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

$$\alpha\beta$$

$$\alpha\beta$$

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

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

$$-\frac{2}{\alpha k^2}$$

$$-\frac{2}{\alpha k^2}$$

$$h^{\#1}_{2^+} \dagger$$

$$h^{\#1}_{2^+} \dagger$$

$$\alpha\beta$$

$$\alpha\beta$$

$$h^{\#1}_{2^+} \dagger$$

$$h^{\#1}_{2^+} \dagger$$

$$-\frac{\alpha k^2}{2}$$

$$-\frac{\alpha k^2}{2}$$

$$\mathcal{T}^{\#1}_{1^+} \dagger$$

$$\mathcal{T}^{\#1}_{1^+} \dagger$$

$$\alpha$$

$$\alpha$$

$$\mathcal{T}^{\#1}_{1^+} \dagger$$

$$\mathcal{T}^{\#1}_{1^+} \dagger$$

$$-\frac{2}{(\alpha\beta)k^2}$$

$$-\frac{2}{(\alpha\beta)k^2}$$

$$\mathcal{T}^{\#1}_{0^+} \dagger$$

$$\mathcal{T}^{\#1}_{0^+} \dagger$$

$$\frac{1}{\alpha k^2}$$

$$\frac{1}{\alpha k^2}$$

$$\mathcal{T}^{\#2}_{0^+} \dagger$$

$$\mathcal{T}^{\#2}_{0^+} \dagger$$

$$0$$

$$0$$

Quartic pole

Pole residue:

$$0 < \frac{6\alpha+3\beta-\sqrt{3}}{\alpha(\alpha-\beta)} \frac{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2}{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2} \&\&$$

$$\frac{6\alpha+3\beta-\sqrt{3}}{\alpha(\alpha-\beta)} \frac{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2}{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2} > 0$$

Polarisations:

1

Quartic pole

Pole residue:

$$0 < \frac{6\alpha+3\beta+\sqrt{3}}{\alpha(\alpha-\beta)} \frac{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2}{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2} \&\&$$

$$\frac{6\alpha+3\beta+\sqrt{3}}{\alpha(\alpha-\beta)} \frac{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2}{\sqrt{12\alpha^2+12\alpha\beta+19\beta^2+64(\alpha-\beta)^2}p^2} > 0$$

Polarisations:

1

(No massive particles)

Unitarity conditions

(Unitarity is demonstrably impossible)

Hexic pole

Pole residue:

$$0 < \frac{2\alpha+\beta}{\alpha^2-\alpha\beta} \&\& \frac{2\alpha+\beta}{\alpha^2-\alpha\beta} > 0$$

Polarisations:

1

Quadratic pole

Pole residue:

$$-\frac{2\alpha-\beta+\sqrt{20\alpha^2-36\alpha\beta+17\beta^2}}{\alpha^2-\alpha\beta} > 0$$

Polarisations:

1

Quadratic pole

Pole residue:

$$\frac{-2\alpha+\beta+\sqrt{20\alpha^2-36\alpha\beta+17\beta^2}}{\alpha(\alpha-\beta)} > 0$$

Polarisations:

1

Quartic pole

Pole residue:

$$0 < \frac{\beta}{\alpha^2-\alpha\beta} \&\& \frac{\beta}{\alpha^2-\alpha\beta} > 0$$

Polarisations:

2

Quadratic pole

Pole residue:

$$-\frac{1}{\alpha} + \frac{1}{-\alpha+\beta} > 0$$

Polarisations:

2

Quadratic pole

Pole residue:

$$-\frac{1}{\alpha} + \frac{5}{-\alpha+\beta} > 0$$

Polarisations:

1

Quadratic pole

Pole residue:

$$\frac{1}{\alpha} + \frac{1}{\alpha-\beta} > 0$$

Polarisations:

2

Quadratic pole

Pole residue:

$$-\frac{1}{\alpha} > 0$$

Polarisations:

2

Quadratic pole

Pole residue:

$$\frac{1}{\alpha} + \frac{5}{\alpha-\beta} > 0$$

Polarisations:

1