

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)

$\mathcal{T}_{0+}^{\#1} + \mathcal{T}_{0+}^{\#2} +$

$$\begin{array}{|c|c|} \hline 0 & \frac{1}{\alpha k^2} \\ \hline \frac{1}{(-\alpha+\beta)k^2} & 0 \\ \hline \end{array}$$

$\mathcal{T}_{0+}^{\#1} \quad \mathcal{T}_{0+}^{\#2}$

$h_{0+}^{\#1} + h_{0+}^{\#2} +$

$$\begin{array}{|c|c|} \hline \alpha k^2 & 0 \\ \hline 0 & (-\alpha+\beta)k^2 \\ \hline \end{array}$$

$h_{0+}^{\#1} \quad h_{0+}^{\#2}$

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

$$\begin{array}{|c|} \hline \frac{1}{2} (-\alpha+\beta)k^2 \\ \hline \end{array}$$

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

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

$$\begin{array}{|c|} \hline -\frac{2}{\alpha k^2} \\ \hline \end{array}$$

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

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

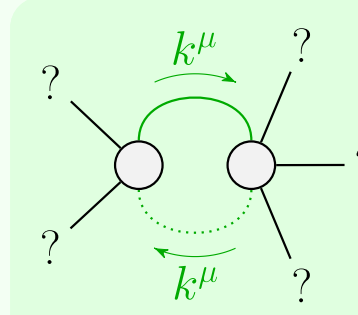
$$\begin{array}{|c|} \hline -\frac{2}{(\alpha-\beta)k^2} \\ \hline \end{array}$$

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

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

$$\begin{array}{|c|} \hline -\frac{\alpha k^2}{2} \\ \hline \end{array}$$

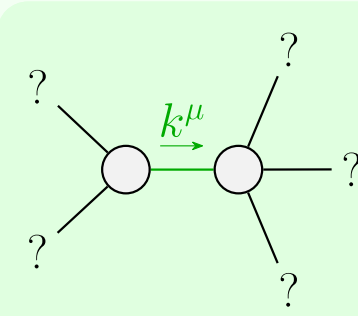
$h_{2+}^{\#1} \quad \alpha\beta$



Quartic pole

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

Polarisations: 1

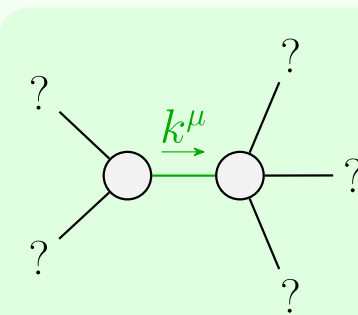


Quadratic pole

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

Polarisations: 2

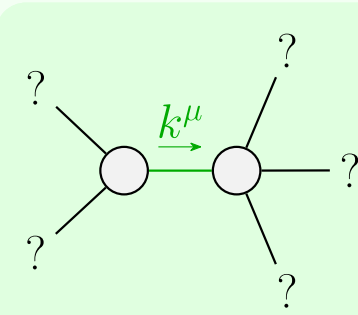
Unitarity conditions  
(Unitarity is demonstrably impossible)



Quadratic pole

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

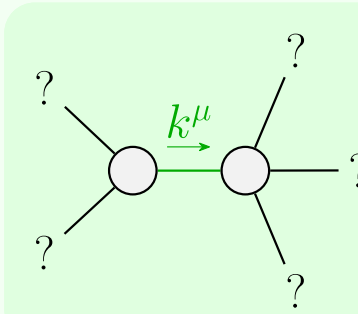
Polarisations: 2



Quadratic pole

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

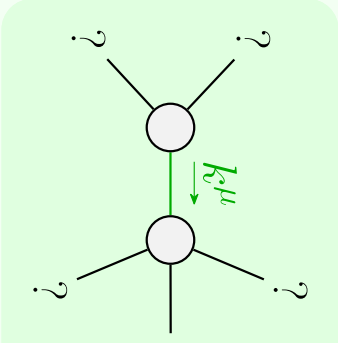
Polarisations: 2



Quadratic pole

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

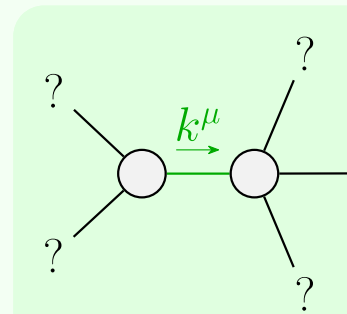
Polarisations: 1



Quadratic pole

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

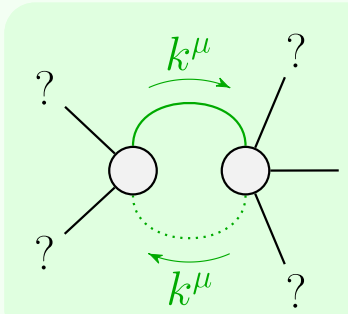
Polarisations: 1



Quadratic pole

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

Polarisations: 1



Quartic pole

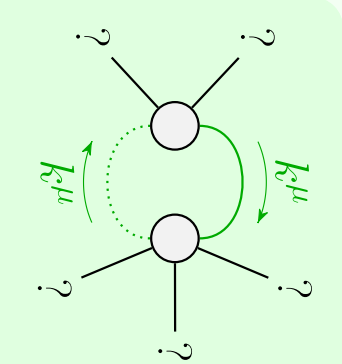
Pole residue:  $0 < \frac{\beta}{\alpha^2-\alpha \beta} \&\& \frac{\beta}{\alpha^2-\alpha \beta} > 0$

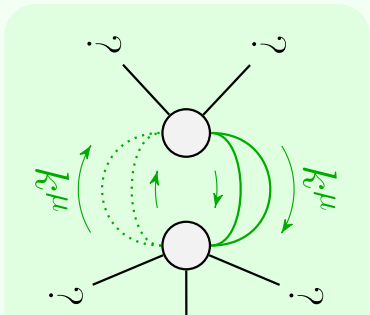
Polarisations: 2

Quartic pole

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

Polarisations: 1



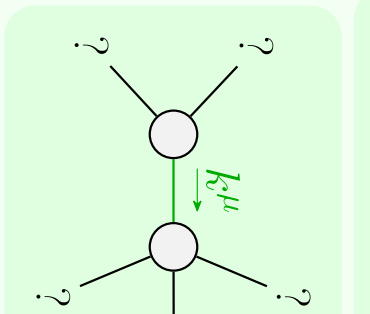


Hexic pole

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

Polarisations: 1

(No massive particles)



Quadratic pole

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

Polarisations: 1