

## Wave operator and propagator

## Quadratic (free) action

$$S_{==}$$

$$\iiint (\beta (h_{\alpha\beta} h^{\alpha\beta} - h^\alpha_\alpha h^\beta_\beta) + h^{\alpha\beta} \mathcal{T}_{\alpha\beta} + \frac{1}{2} \alpha (\partial_\beta h^\chi_\chi \partial^\beta h^\alpha_\alpha + 2 \partial_\alpha h^{\alpha\beta} \partial_\chi h^\chi_\beta - 2 \partial^\beta h^\alpha_\alpha \partial_\chi h^\chi_\beta - \partial_\chi h^\alpha_\alpha \partial^\chi h^{\alpha\beta})) [t, x, y, z] dz dy dx dt$$

Diagram illustrating the construction of the 2x2 block matrix for the second iteration of the Schur complement method. The blocks are labeled with superscripts indicating the iteration number and subscripts indicating the variables involved.

The matrix structure is shown as a 2x2 block matrix:

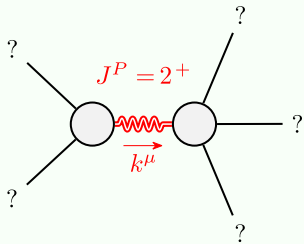
$$\begin{bmatrix} \mathcal{T}_{2^+}^{\#1} + \alpha\beta & \mathcal{T}_{2^+}^{\#1} + \alpha\beta \\ \mathcal{T}_{1^+}^{\#1} + \alpha & \mathcal{T}_{1^+}^{\#1} + \alpha \end{bmatrix}$$

The blocks are further detailed as follows:

- $\mathcal{T}_{2^+}^{\#1} + \alpha\beta$  (Top-left block): A 2x2 matrix with elements:
 
$$\begin{bmatrix} -2\beta + \alpha k^2 & -\sqrt{3}\beta \\ -\sqrt{3}\beta & 0 \end{bmatrix}$$
- $\mathcal{T}_{2^+}^{\#1} + \alpha\beta$  (Top-right block): A 2x2 matrix with elements:
 
$$\begin{bmatrix} \frac{1}{\beta - \frac{\alpha k^2}{2}} & \beta - \frac{\alpha k^2}{2} \end{bmatrix}$$
- $\mathcal{T}_{1^+}^{\#1} + \alpha$  (Bottom-left block): A 2x2 matrix with elements:
 
$$\begin{bmatrix} \frac{1}{\beta} & \beta \end{bmatrix}$$
- $\mathcal{T}_{1^+}^{\#1} + \alpha$  (Bottom-right block): A 2x2 matrix with elements:
 
$$\begin{bmatrix} -\frac{1}{\sqrt{3}\beta} & 0 \\ \frac{2\beta - \alpha k^2}{3\beta^2} & -\frac{1}{\sqrt{3}\beta} \end{bmatrix}$$

The diagram also includes a green box labeled "(No source constraints)".

# Massive and massless spectra



Massive particle	
Pole residue:	$-\frac{2}{\alpha} > 0$
Polarisations:	5
Square mass:	$\frac{2\beta}{\alpha} > 0$
Spin:	2
Parity:	Even

(No massless particles)

## Unitarity conditions

$$\alpha < 0 \ \&\& \ \beta < 0$$