

Particle spectrograph

Wave operator and propagator

Quadratic (free) action

$$S \equiv$$

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

Diagram illustrating the construction of the augmented Hessian matrix $H_{\text{aug}}^{\text{new}}$ for the case with no source constraints.

The matrix is composed of several blocks, each representing a sub-matrix of the Hessian. The blocks are labeled with their respective indices and constraints.

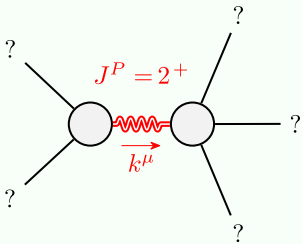
The blocks shown are:

- $h_0^{\#1} + h_0^{\#2}$ (Top-left block, pink background)
- $h_2^{\#1} + h_2^{\#2}$ (Top-right block, pink background)
- $h_1^{\#1} + h_1^{\#2}$ (Middle-left block, pink background)
- $h_0^{\#1} + h_0^{\#2}$ (Bottom-left block, pink background)
- $h_2^{\#1} + h_2^{\#2}$ (Bottom-right block, pink background)
- $h_1^{\#1} + h_1^{\#2}$ (Bottom-middle block, pink background)

The constraints are indicated by the labels $\tau_{2^+}^{\#1} + \alpha\beta$, $\tau_{2^+}^{\#2} + \alpha\beta$, $\tau_{1^+}^{\#1} + \alpha$, and $\tau_{1^+}^{\#2} + \alpha$.

The matrix is constructed under the condition: (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

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