Particle spectrograph

Wave operator and propagator

Quadratic (free) action

$\mathcal{S}_{\mathrm{F}} ==$

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

$$\begin{array}{c|cc} & h^{\#1}_{0^+}{}^\dagger & h^{\#2}_{0^+}{}^\dagger \\ \hline h^{\#1}_{0^+} & -2\beta+\alpha k^2 & -\sqrt{3}\,\beta \\ h^{\#2}_{0^+} & -\sqrt{3}\,\beta & 0 \end{array}$$

$$\begin{array}{c|cc} & \mathcal{T}^{\#1}_{0^+}{}^\dagger & \mathcal{T}^{\#2}_{0^+}{}^\dagger \\ \hline \mathcal{T}^{\#1}_{0^+} & 0 & -\frac{1}{\sqrt{3}\,\beta} \\ \mathcal{T}^{\#2}_{0^+} & -\frac{1}{\sqrt{3}\,\beta} & \frac{2\beta-\alpha k^2}{3\beta^2} \end{array}$$

$$\begin{array}{c|c} & \mathcal{T}^{\#1}_{2^+}{}^\dagger{}^{\alpha\beta} \\ \hline \mathcal{T}^{\#1}_{2^+}{}_{\alpha\beta} & \frac{1}{\beta-\frac{\alpha k^2}{2}} \end{array}$$

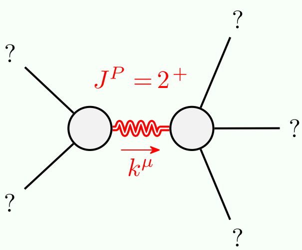
$$\begin{array}{c|c} & h^{\#1}_{2^+}{}^\dagger{}^{\alpha\beta} \\ \hline h^{\#1}_{2^+}{}_{\alpha\beta} & \beta-\frac{\alpha k^2}{2} \end{array}$$

$$\begin{array}{c|c} & \mathcal{T}^{\#1}_{1^-}{}^\dagger{}^{\alpha} \\ \hline \mathcal{T}^{\#1}_{1^-}{}_{\alpha} & \frac{1}{\beta} \end{array}$$

(No source constraints)

$$\begin{array}{c|c} & h^{\#1}_{1^-}{}_{\alpha} \\ \hline h^{\#1}_{1^-}{}^\dagger{}^{\alpha} & \beta \end{array}$$

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

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