

Particle spectrograph

Wave operator and propagator

Quadratic (free) action

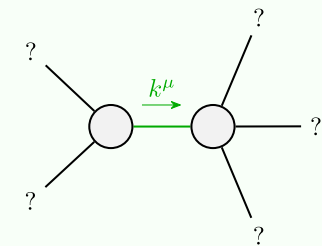
$$S == \iiint\int (h^{\alpha\beta} \mathcal{T}_{\alpha\beta} + \alpha \partial_\beta h^{\chi}_{\chi} \partial^\beta h^{\alpha}_{\alpha} + \alpha (-2 \partial_\beta h_{\alpha\chi} + \partial_\chi h_{\alpha\beta}) \partial^\chi h^{\alpha\beta}) [t, x, y, z] dz dy dx dt$$

Source constraints/gauge generators

SO(3) irreps	Multiplicities
$\mathcal{T}^{\#1\alpha}_{1^-} == 0$	3
Total constraints:	3

	$\mathcal{T}^{\#1}_{0^+}$	$\mathcal{T}^{\#2}_{0^+}$	$h^{\#2}_{0^+}$	$h^{\#1}_{0^+}$
$\mathcal{T}^{\#1}_{0^+} \dagger$	0	$\frac{1}{\sqrt{3} \alpha k^2}$	$\sqrt{3} \alpha k^2$	$4 \alpha k^2$
$\mathcal{T}^{\#2}_{0^+} \dagger$	$\frac{1}{\sqrt{3} \alpha k^2}$	$-\frac{4}{3 \alpha k^2}$	0	$\sqrt{3} \alpha k^2$
$h^{\#1}_{1^-} \alpha$				
$h^{\#1}_{1^-} \dagger \alpha$				0

Massive and massless spectra



Quadratic pole	
Pole residue:	$\frac{1}{\alpha} > 0$
Polarisations:	3

(No massive particles)

Unitarity conditions

$$\alpha > 0$$