Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

Source constraints/gauge generators

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

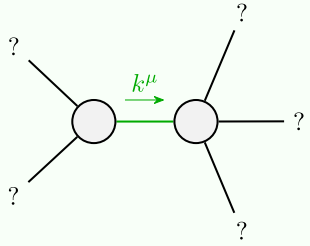
$\mathcal{T}_{0^+}^{\#1} \dagger$ \ $\mathcal{T}_{0^+}^{\#2}$	$\mathcal{T}_{0^+}^{\#1}$	$\mathcal{T}_{0^+}^{\#2}$
$\mathcal{T}_{0^+}^{\#1} \dagger$	0	$\frac{1}{\sqrt{3}\,\alpha k^2}$
$\mathcal{T}_{0^+}^{\#2} \dagger$	$\frac{1}{\sqrt{3}\,\alpha k^2}$	$-\frac{4}{3\,\alpha k^2}$

$h_{0^+}^{\#2} \dagger$ \ $h_{0^+}^{\#1} \dagger$	$h_{0^+}^{\#1}$	$h_{0^+}^{\#2}$
$\sqrt{3}\,\alpha k^2$	$4\,\alpha k^2$	
0		$\sqrt{3}\,\alpha k^2$

$\mathcal{T}_{2^+}^{\#1} \dagger^{\alpha\beta}$	$h_{2^+}^{\#1} \dagger^{\alpha\beta}$	$\mathcal{T}_{1^-}^{\#1} \dagger^{\alpha}$
$\frac{1}{\alpha k^2}$	αk^2	0

$h_{1^-}^{\#1} \dagger^{\alpha}$	$h_{1^-}^{\#1\,\alpha}$
	0

Massive and massless spectra



Quadratic pole

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

(No massive particles)

Unitarity conditions

$\alpha > 0$