Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

Source constraints/gauge generators

SO(3) irreps	Multiplicities
$\mathcal{T}^{\#2}_{0^+} == 0$	1
$\mathcal{T}^{\#1\,\alpha}_{1^-} == 0$	3
Total constraints:	4

	$\mathcal{T}^{\#1}_{0^+}$	$\mathcal{T}^{\#2}_{0^+}$
$\mathcal{T}^{\#1}_{0^+}$	$\frac{1}{\alpha k^2}$	0
$\mathcal{T}^{\#2}_{0^+}$	0	0

	$h^{\#1}_{0^+}$	$h^{\#2}_{0^+}$
$h^{\#1}_{0^+}$	αk^2	0
$h^{\#2}_{0^+}$	0	0

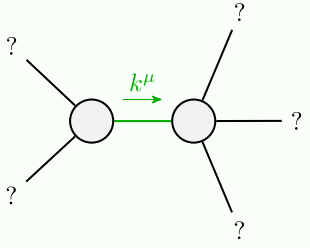
	$\mathcal{T}^{\#1}_{2^+\,\alpha\beta}$
$\mathcal{T}^{\#1}_{2^+}\dagger^{\alpha\beta}$	$-\frac{2}{\alpha k^2}$

	$h^{\#1}_{2^+\,\alpha\beta}$
$h^{\#1}_{2^+}\dagger^{\alpha\beta}$	$-\frac{\alpha k^2}{2}$

	$\mathcal{T}^{\#1}_{1^-\,\alpha}$
$\mathcal{T}^{\#1}_{1^-}\dagger^{\alpha}$	0

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

Massive and massless spectra



Quadratic pole

Pole residue:	$-\frac{1}{\alpha} > 0$
Polarisations:	2

(No massive particles)

Unitarity conditions

$\alpha < 0$