Particle spectrograph

Wave operator and propagator

Quadratic (free) Lagrangian density

$$\beta\, h_{\alpha\beta}\, h^{\alpha\beta} - \gamma\, h^{\alpha}{}_{\alpha}\, h^{\beta}{}_{\beta} + h^{\alpha\beta}\, \mathcal{T}_{\alpha\beta} + \frac{1}{2}\,\alpha\,\partial_{\beta}h^{\chi}{}_{\chi}\,\partial^{\beta}h^{\alpha}{}_{\alpha} + \alpha\,\partial_{\alpha}h^{\alpha\beta}\,\partial_{\chi}h_{\beta}{}^{\chi} - \alpha\,\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\chi}h_{\beta}{}^{\chi} - \frac{1}{2}\,\alpha\,\partial_{\chi}h_{\alpha\beta}\,\partial^{\chi}h^{\alpha\beta}$$

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

	$h^{\#1}_{0^+}$	$h^{\#2}_{0^+}$
$h^{\#1}_{0^+}\,\dagger$	$\beta-3\gamma+\alpha k^2$	$-\sqrt{3}\,\gamma$
$h^{\#2}_{0^+}\,\dagger$	$-\sqrt{3}\,\gamma$	$\beta-\gamma$

(No source constraints)

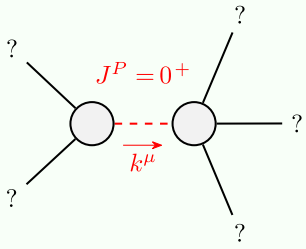
	$h^{\#1}_{2^+}{}_{\alpha\beta}$
$h^{\#1}_{2^+}\,\dagger^{\alpha\beta}$	$\beta-\frac{\alpha k^2}{2}$

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

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

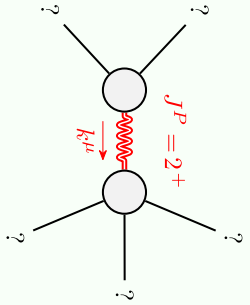
$\mathcal{T}^{\#1}_{2^+}\,\dagger^{\alpha\beta}$	$\mathcal{T}^{\#1}_{2^+}{}_{\alpha\beta}$
$\frac{1}{\beta-\frac{\alpha k^2}{2}}$	

Massive and massless spectra



Massive particle	
Pole residue:	$\frac{\beta^2-2\beta\gamma+4\gamma^2}{\alpha(\beta-\gamma)^2} > 0$
Polarisations:	1
Square mass:	$-\frac{\beta(\beta-4\gamma)}{\alpha(\beta-\gamma)} > 0$
Spin:	0
Parity:	Even

(No massless particles)



Massive particle	
Pole residue:	$-\frac{2}{\alpha} > 0$
Polarisations:	5
Square mass:	$\frac{2\beta}{\alpha} > 0$
Spin:	2
Parity:	Even

Unitarity conditions

(Unitarity is demonstrably impossible)