#### Particle spectrograph

### Wave operator and propagator

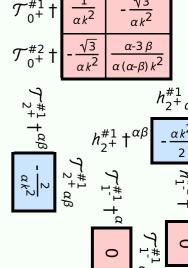
# Quadratic (free) action $S == \iiint (h^{\alpha\beta} \mathcal{T}_{\alpha\beta} + \frac{1}{2} \beta \partial_{\beta} h^{\chi}_{\chi} \partial^{\beta} h^{\alpha}_{\alpha} + \alpha (\partial_{\alpha} h^{\alpha\beta} \partial_{\chi} h_{\beta}^{\chi} - \partial^{\beta} h^{\alpha}_{\alpha} \partial_{\chi}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

Source constraints		
SO(3) irreps	Fundamental fields	Multiplicities
$\mathcal{T}_{1}^{\#1\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\mathcal{T}^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\mathcal{T}^{\alpha\beta}$	3
Total constraints/gauge generators: 3		

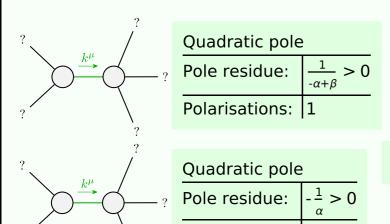
$$h_{0+}^{\#1} + h_{0+}^{\#2}$$

$$h_{0+}^{\#1} + \frac{1}{2} (\alpha - 3 \beta) k^{2} \frac{1}{2} \sqrt{3} (-\alpha + \beta) k^{2}$$

$$h_{0+}^{\#2} + \frac{1}{2} \sqrt{3} (-\alpha + \beta) k^{2} \frac{1}{2} (-\alpha + \beta) k^{2}$$



### Massive and massless spectra



Polarisations: 2

(No massive particles)

## **Unitarity conditions**

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