

# Particle spectrograph

## Wave operator and propagator

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

$\mathcal{J}_{1^+}^{\#1+\alpha\beta}$ 

$\frac{3}{\gamma\kappa^2}$	0
0	0

 $\mathcal{J}_{1^-}^{\#1\alpha}$

$\mathcal{B}_{1^+}^{\#1+\alpha\beta}$ 

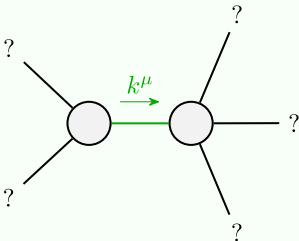
$\frac{\gamma\kappa^2}{3}$	0
0	0

 $\mathcal{B}_{1^-}^{\#1\alpha}$

### Quadratic (free) action

$$S = \iiint (\mathcal{B}^{\alpha\beta} \mathcal{J}_{\alpha\beta} + \frac{1}{3} \gamma (-2 \partial_\beta \mathcal{B}_{\alpha\chi} + \partial_\chi \mathcal{B}_{\alpha\beta}) \partial^\chi \mathcal{B}^{\alpha\beta}) [t, x, y, z] dz dy dx dt$$

## Massive and massless spectra



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

(No massive particles)

## Unitarity conditions

$\gamma > 0$