

# 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 |

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

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

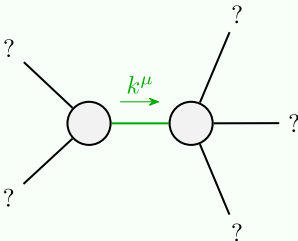
|                            |   |
|----------------------------|---|
| $\frac{\gamma\kappa^2}{3}$ | 0 |
| 0                          | 0 |

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

### 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

$\gamma > 0$