

# Particle spectrograph

## Wave operator and propagator

$$S = \iiint (\delta \mathcal{B}_{\alpha\beta} \mathcal{B}^{\alpha\beta} + \mathcal{B}^{\alpha\beta} \mathcal{J}_{\alpha\beta} + \frac{1}{3} \gamma (-2 \partial_\beta \mathcal{B}_{\alpha\chi} + \partial_\chi \mathcal{B}_{\alpha\beta}) \partial^\chi \mathcal{B}^{\alpha\beta}) [t, x, y, z] d^4x$$

	$\overset{\#1}{1^+} \mathcal{J}_{\alpha\beta}$	$\overset{\#1}{1^-} \mathcal{J}_\alpha$	$\overset{\#1}{1^+} \mathcal{B}_{\alpha\beta}$	$\overset{\#1}{1^-} \mathcal{B}_\alpha$	(No source constraints)
$\overset{\#1}{1^+} \mathcal{J}^{\alpha\beta}$	$\frac{1}{\delta + \frac{\gamma \kappa^2}{3}}$	0	$\delta + \frac{\gamma \kappa^2}{3}$	0	
$\overset{\#1}{1^-} \mathcal{J}^\alpha$	0	$\frac{1}{\delta}$	0	$\delta$	

## Massive and massless spectra

Poleresidue:	$\frac{3}{\gamma} > 0$
Square mass:	$\frac{3\delta}{\gamma} > 0$
Spin:	1
Parity:	Even

Massive particle

(No massless particles)

## Unitarity conditions

$$\gamma > 0 \ \&\& \ \delta < 0$$