Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

$$\mathcal{B}^{\#1}_{1^-\,\alpha} \quad \mathcal{B}^{\#1}_{1^-} \dagger^{\alpha} \boxed{\gamma + 2\,\alpha\,k^2}$$

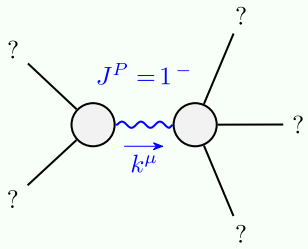
$$\mathcal{J}^{\#1}_{0^+} \quad \mathcal{J}^{\#1}_{0^+} \dagger \boxed{\frac{1}{\gamma}}$$

$$\mathcal{J}^{\#1}_{1^-\,\alpha} \quad \mathcal{J}^{\#1}_{1^-} \dagger^{\alpha} \boxed{\frac{1}{\gamma + 2\,\alpha\,k^2}}$$

$$\mathcal{B}^{\#1}_{0^+} \dagger \boxed{\gamma} \mathcal{B}^{\#1}_{0^+}$$

(No source constraints)

Massive and massless spectra



Massive particle

Pole residue:	$-\frac{1}{2\,\alpha} > 0$
Polarisations:	3
Square mass:	$-\frac{\gamma}{2\,\alpha} > 0$
Spin:	1
Parity:	Odd

(No massless particles)

Unitarity conditions

$\alpha < 0$ && $\gamma > 0$