Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

$$\mathcal{B}_{0^+}^{\#1} \dagger \overset{\mathcal{B}_{0^+}^{\#1}}{\boxed{\gamma + (\alpha+\beta)\, k^2}}$$

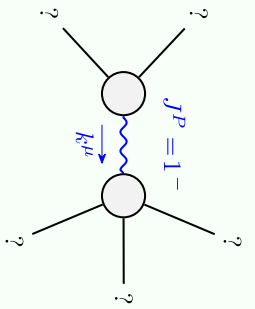
(No source constraints)

$$\mathcal{J}_{0^+}^{\#1} \dagger \overset{\mathcal{J}_{0^+}^{\#1}}{\boxed{\frac{1}{\gamma+(\alpha+\beta)\, k^2}}}$$

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

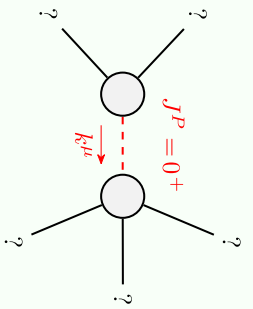
$$\mathcal{J}_{1^-}^{\#1} \dagger^{\alpha} \overset{\mathcal{J}_{1^-}^{\#1}\ \alpha}{\boxed{\frac{1}{\gamma+\alpha\, k^2}}}$$

Massive and massless spectra



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

(No massless particles)



Massive particle	
Pole residue:	$\frac{1}{\alpha+\beta} > 0$
Polarisations:	1
Square mass:	$-\frac{\gamma}{\alpha+\beta} > 0$
Spin:	0
Parity:	Even

Unitarity conditions

(Unitarity is demonstrably impossible)