Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

$\mathcal{J}^{\#1}_{1^-} \dagger^{\alpha}$ | $\frac{1}{\alpha k^2}$ | $\mathcal{J}^{\#1}_{1^-\,\alpha}$

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

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

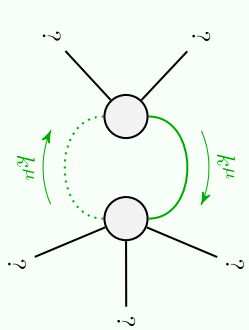
$\mathcal{B}^{\#1}_{1^-} \dagger^{\alpha}$ | αk^2 | $\mathcal{B}^{\#1}_{1^-\,\alpha}$

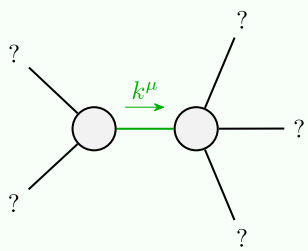
(No source constraints)

$\mathcal{J}^{\#1}_{0^+}$

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

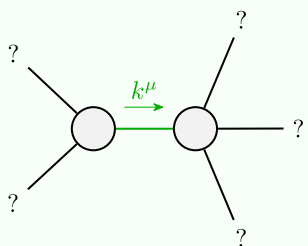
Massive and massless spectra



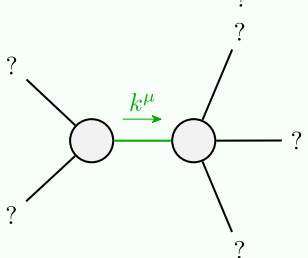


Quadratic pole	
Pole residue:	$\frac{1}{\alpha} + \frac{1}{\alpha+\beta} > 0$
Polarisations:	1

(No massive particles)



Quadratic pole	
Pole residue:	$-\frac{1}{\alpha} - \frac{1}{\alpha+\beta} > 0$
Polarisations:	1



Quadratic pole	
Pole residue:	$-\frac{1}{\alpha} > 0$
Polarisations:	2

Quartic pole	
Pole residue:	$0 < -\frac{\beta}{\alpha(\alpha+\beta)}$ && $-\frac{\beta}{\alpha(\alpha+\beta)} > 0$
Polarisations:	1

Unitarity conditions

(Unitarity is demonstrably impossible)