Particle spectrograph

Wave operator and propagator

Quadratic (free) action

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

(No source constraints)

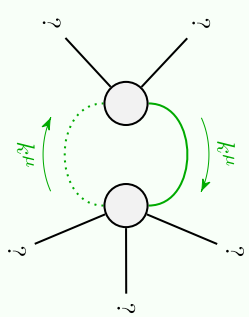
$\mathcal{T}^{\#1}_{0^+}$ † $\mathcal{T}^{\#1}_{0^+}$: $\frac{1}{(\alpha+\beta)\,k^2}$

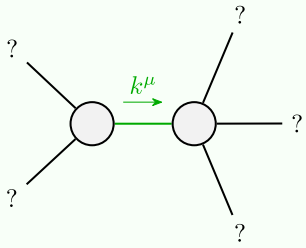
$\mathcal{T}^{\#1}_{1^-}$ † $\mathcal{T}^{\#1}_{1^-}$: $\frac{1}{\alpha\,k^2}$ α

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

$\mathcal{B}^{\#1}_{1^-}$ † $\mathcal{B}^{\#1}_{1^-}$: $\alpha\,k^2$ α

Massive and massless spectra





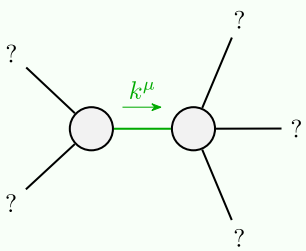
Quadratic pole

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

(No massive particles)

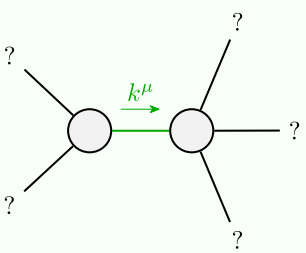
Quartic pole

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



Quadratic pole

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



Quadratic pole

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

Unitarity conditions

(Unitarity is demonstrably impossible)