Particle spectrograph

Wave operator and propagator

Quadratic (free) action

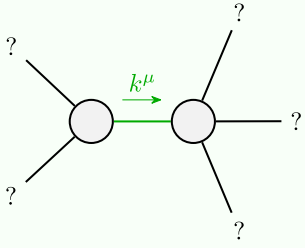
$$\mathcal{S} == \int\int\int\int (\phi\,\rho + \alpha\,\partial_\alpha\phi\,\partial^\alpha\phi)[t, x, y, z]\,dz\,dy\,dx\,dt$$

$$\rho_{0^+}^{\#1} \dagger \boxed{\frac{1}{\alpha\,k^2}}$$

(No source constraints)

$$\phi_{0^+}^{\#1} \dagger \boxed{\alpha\,k^2}$$

Massive and massless spectra



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

(No massive particles)

Unitarity conditions

$\alpha > 0$