

# Wave operator and propagator

A diagram showing two fermion lines (circles) interacting via a scalar particle (wavy line). The left fermion line is labeled  $J^P = 2^-$ . The scalar particle is labeled  $k^\mu$ . The right fermion line is labeled with a question mark. The interaction is represented by a wavy line connecting the two fermion lines, with an arrow pointing from left to right.

(No massless particles)

# Unitarity conditions

$\omega_0^{\#1}$	$f_0^{\#1}$	$f_0^{\#2}$	$\omega_0^{\#}$
$\omega_0^{\#1+}$	$-t_1$	$i\sqrt{2}kt_1$	0
$f_0^{\#1+}$	$-i\sqrt{2}kt_1$	$-2k^2t_1$	0
$f_0^{\#2+}$	0	0	0
$\omega_0^{\#1+}$	0	0	0

$\omega_2^{\#1}$	$\omega_2^{\#1} + \alpha$	$-\frac{ikt_1}{\sqrt{2}}$	0
$f_2^{\#1}$	$f_2^{\#1} + \alpha$	$k^2 t_1$	0
$\omega_2^{\#1}$	$\omega_2^{\#1} + \alpha$	$\frac{t_1}{2}$	$k^2 r_1 + \frac{t_1}{2}$