

# Particle spectrograph

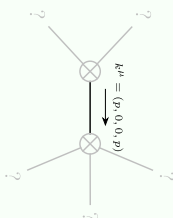
## Wave operator and propagator

Spin-parity form	Covariant form	Multiplicities
$0^+ \tau == 0$	$\partial_\beta \partial_\alpha \tau^{\alpha\beta} == 0$	1
$1^- \tau^\alpha == 0$	$\partial_\chi \partial_\beta \partial^\alpha \tau^{\beta\chi} == \partial_\chi \partial^\chi \partial_\beta \tau^{\beta\alpha}$	3
$2^+ \tau^{\alpha\beta} == 0$	4 $\partial_\delta \partial_\chi \partial^\beta \partial^\alpha \tau^{\chi\delta} + 2 \partial_\delta \partial^\delta \partial^\beta \partial^\alpha \tau^\chi_\chi + 3 \partial_\delta \partial^\delta \partial_\chi \partial^\alpha \tau^{\chi\beta} + 3 \partial_\delta \partial^\delta \partial_\chi \partial^\alpha \tau^{\beta\alpha} +$ $2 \eta^{\alpha\beta} \partial_\epsilon \partial^\epsilon \partial_\delta \partial_\chi \tau^{\chi\delta} == 3 \partial_\delta \partial^\delta \partial_\chi \partial^\alpha \tau^{\beta\chi} + 3 \partial_\delta \partial^\delta \partial_\chi \partial^\alpha \tau^{\chi\beta} +$ $3 \partial_\delta \partial^\delta \partial_\chi \partial^\beta \tau^{\alpha\chi} + 3 \partial_\delta \partial^\delta \partial_\chi \partial^\beta \tau^{\chi\alpha} + 2 \eta^{\alpha\beta} \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\delta \tau^\chi_\chi$	5
Total expected gauge generators:		9

$$S = \iiint (f^{\alpha\beta} \tau_{\alpha\beta} + c_3 (\partial_\mu f^\nu_\nu \partial^\mu f^\alpha_\alpha + \partial_\mu f^{\alpha\mu} \partial_\nu f^\nu_\alpha - 2 \partial^\mu f^\alpha_\alpha \partial_\nu f^\nu_\mu) + \\ 2 c_1 (2 \partial^\alpha f_{\beta\nu} - \partial^\alpha f_{\nu\beta} - \partial^\beta f_{\alpha\nu} + \partial_\nu f_{\alpha\beta} - \partial_\nu f_{\beta\alpha}) \partial^\nu f^{\alpha\beta}) [t, x, y, z] d x d y d z d t$$

[illegible]

## Massive and massless spectra



(No particles)

Massless particle

Poleresidue:  $\frac{1}{2} > 0$

Polarisations: 1

## Unitarity conditions