Particle spectrograph

Wave operator and propagator

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

$$\mathcal{S} == \iiiint \Big(\beta\,\mathcal{B}_{\alpha\beta}\,\mathcal{B}^{\alpha\beta} + f^{\alpha\beta}\,\tau_{\alpha\beta} + \mathcal{B}^{\alpha\beta}\,\mathcal{T}_{\alpha\beta} + c_3\big(\partial_\beta f^{\chi}{}_{\chi}\,\partial^\beta f^{\alpha}{}_{\alpha} - 2\,\partial^\beta f^{\alpha}{}_{\alpha}\,\partial_\chi f_{\beta}{}^{\chi} + \partial_\beta f^{\alpha\beta}\,(\partial_\chi f_{\alpha}{}^{\chi} + 2\,\partial_\chi\mathcal{B}_{\alpha}{}^{\chi}) - \partial_\alpha\mathcal{B}^{\alpha\beta}\,\partial_\chi\mathcal{B}_{\beta}{}^{\chi} - 2\,\partial^\beta f^{\alpha}{}_{\alpha}\,\partial_\chi\mathcal{B}_{\beta}{}^{\chi}\big) - \tfrac{1}{3}\,\alpha\,(2\,\partial_\beta\mathcal{B}_{\alpha\chi} - \partial_\chi\mathcal{B}_{\alpha\beta})\,\partial^\chi\mathcal{B}^{\alpha\beta} + 2\,c_1\big(2\,\partial_\alpha f_{\beta\chi}\,\partial^\chi f^{\alpha\beta} - \partial_\alpha f_{\chi\beta}\,\partial^\chi f^{\alpha\beta} + 4\,\partial_\alpha\mathcal{B}_{\beta\chi}\,\partial^\chi f^{\alpha\beta} - \partial_\beta f_{\alpha\chi}\,\partial^\chi f^{\alpha\beta} - 4\,\partial_\beta\mathcal{B}_{\alpha\chi}\,\partial^\chi f^{\alpha\beta} + \partial_\chi f_{\alpha\beta}\,\partial^\chi f^{\alpha\beta} - \partial_\chi f_{\beta\alpha}\,\partial^\chi f^{\alpha\beta} + 4\,\partial_\chi\mathcal{B}_{\alpha\beta}\,\partial^\chi f^{\alpha\beta} - 4\,\partial_\beta\mathcal{B}_{\alpha\chi}\,\partial^\chi\mathcal{B}^{\alpha\beta} + 2\,\partial_\chi\mathcal{B}_{\alpha\beta}\,\partial^\chi\mathcal{B}^{\alpha\beta}\big)\Big)[t,x,y,z]\,d z\,d y\,d x\,d t$$

	$\overset{\#1}{0}{}^{+}\,\tau$	$\overset{\#2}{0}{}^{+}\,\tau$
$\overset{\#1}{0}{}^{+}\,\tau\dagger$	$\frac{1}{3 c_3 k^2}$	0
$\overset{\#2}{0}{}^{+}\,\tau\dagger$	0	0

	$\overset{\#1}{0}{}^{+}\,f$	$\overset{\#2}{0}{}^{+}\,f$
$\overset{\#1}{0}{}^{+}\,f\dagger$	$3 c_3 k^2$	0
$\overset{\#2}{0}{}^{+}\,f\dagger$	0	0

	$\overset{\#1}{2}{}^{+}\,f_{\alpha\beta}$
$\overset{\#1}{2}{}^{+}\,f\dagger^{\alpha\beta}$	0

	$\overset{\#1}{2}{}^{+}\,\tau_{\alpha\beta}$
$\overset{\#1}{2}{}^{+}\,\tau\dagger^{\alpha\beta}$	0

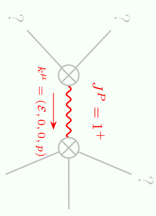
	$\overset{\#1}{1}{}^{+}\,\mathcal{T}_{\alpha\beta}$	$\overset{\#1}{1}{}^{+}\,\tau_{\alpha\beta}$	$\overset{\#1}{1}{}^{-}\,\mathcal{T}_{\alpha}$	$\overset{\#1}{1}{}^{-}\,\tau_{\alpha}$	$\overset{\#2}{1}{}^{-}\,\tau_{\alpha}$
$\overset{\#1}{1}{}^{+}\,\mathcal{T}\dagger^{\alpha\beta}$	$\frac{1}{\frac{k^2\alpha}{3}+\beta}$	$-\frac{3}{k^2\alpha+3\beta}$	0	0	0
$\overset{\#1}{1}{}^{+}\,\tau\dagger^{\alpha\beta}$	$-\frac{3}{k^2\alpha+3\beta}$	$\frac{1}{4 c_1 k^2}+\frac{1}{\frac{k^2\alpha}{3}+\beta}$	0	0	0
$\overset{\#1}{1}{}^{-}\,\mathcal{T}\dagger^{\alpha}$	0	0	$\frac{1}{\beta}$	0	$-\frac{1}{\sqrt{2}\,\beta}$
$\overset{\#1}{1}{}^{-}\,\tau\dagger^{\alpha}$	0	0 0		0	0
$\overset{\#2}{1}{}^{-}\,\tau\dagger^{\alpha}$	0	0	$-\frac{1}{\sqrt{2}\,\beta}$	0	$\frac{1}{c_3 k^2}+\frac{1}{2\beta}$

	$\overset{\#1}{1}{}^{+}\,\mathcal{B}_{\alpha\beta}$	$\overset{\#1}{1}{}^{+}\,f_{\alpha\beta}$	$\overset{\#1}{1}{}^{-}\,\mathcal{B}_{\alpha}$	$\overset{\#1}{1}{}^{-}\,f_{\alpha}$	$\overset{\#2}{1}{}^{-}\,f_{\alpha}$
$\overset{\#1}{1}{}^{+}\,\mathcal{B}\dagger^{\alpha\beta}$	$\frac{1}{3}k^2(12 c_1+\alpha)+\beta$	$4 c_1 k^2$	0	0	0
$\overset{\#1}{1}{}^{+}\,f\dagger^{\alpha\beta}$	$4 c_1 k^2$	$4 c_1 k^2$	0	0	0
$\overset{\#1}{1}{}^{-}\,\mathcal{B}\dagger^{\alpha}$	0 0		$\frac{c_3 k^2}{2}+\beta$	0	$\frac{c_3 k^2}{\sqrt{2}}$
$\overset{\#1}{1}{}^{-}\,f\dagger^{\alpha}$	0 0	0		0	0
$\overset{\#2}{1}{}^{-}\,f\dagger^{\alpha}$	0 0		$\frac{c_3 k^2}{\sqrt{2}}$	0	$c_3 k^2$

Massive and massless spectra

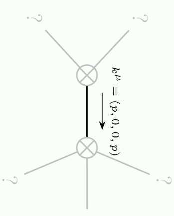
Massive particle

Poleresidue:	$\frac{9}{\alpha} > 0$
Square mass:	$-\frac{3\beta}{\alpha} > 0$
Spin:	1
Parity:	Even



Massless particle

Poleresidue:	$\frac{1}{c_1} > 0$
Polarisations:	1



Unitarity conditions