Particle spectrograph

Wave operator and propagator

Spin-parity form	Covariant form	Multiplicities
$\overset{\#1}{0}^{+}\sigma == 0$	$\partial_\beta \sigma^{\alpha\beta}{}_{\alpha} == 0$	1
$\overset{\#2}{1}^{-}\sigma^{\alpha} == 0$	$\partial_\chi \partial_\beta \sigma^{\alpha\beta\chi} == 0$	3
$\overset{\#2}{1}^{+}\sigma^{\alpha\beta} == 0$	$\partial_\delta \partial_\chi \partial^\alpha \sigma^{\beta\chi\delta} + \partial_\delta \partial^\delta \partial_\chi \sigma^{\alpha\beta\chi} == \partial_\delta \partial_\chi \partial^\beta \sigma^{\alpha\chi\delta}$	3
$\overset{\#1}{2}^{-}\sigma^{\alpha\beta\chi} == 0$ 3	$\partial_\epsilon \partial_\delta \partial^\chi \partial^\alpha \sigma^{\beta\delta\epsilon} + 3\, \partial_\epsilon \partial^\epsilon \partial^\chi \partial^\alpha \sigma^{\beta\delta}{}_{\delta} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\beta \sigma^{\alpha\chi\delta} + 4\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\beta \sigma^{\alpha\delta\chi} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\beta \sigma^{\chi\delta\alpha} + 4\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\chi \sigma^{\alpha\beta\delta} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\chi \sigma^{\alpha\delta\beta} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\delta \sigma^{\beta\chi\alpha} + 3\, \eta^{\beta\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial^\alpha \sigma^{\delta\epsilon}{}_{\delta} + 3\, \eta^{\alpha\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial_\delta \sigma^{\beta\delta\epsilon} + 3\, \eta^{\beta\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial^\epsilon \sigma^{\alpha\delta}{}_{\delta} == 3\, \partial_\epsilon \partial_\delta \partial^\chi \partial^\beta \sigma^{\alpha\delta\epsilon} + 3\, \partial_\epsilon \partial^\epsilon \partial^\chi \partial^\beta \sigma^{\alpha\delta}{}_{\delta} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\alpha \sigma^{\beta\chi\delta} + 4\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\alpha \sigma^{\beta\delta\chi} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\alpha \sigma^{\chi\delta\beta} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\chi \sigma^{\beta\delta\alpha} + 4\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\delta \sigma^{\alpha\beta\chi} + 2\, \partial_\epsilon \partial^\epsilon \partial_\delta \partial^\delta \sigma^{\alpha\chi\beta} + 3\, \eta^{\alpha\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial^\beta \sigma^{\delta\epsilon}{}_{\delta} + 3\, \eta^{\beta\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial_\delta \sigma^{\alpha\delta\epsilon} + 3\, \eta^{\alpha\chi}\, \partial_\phi \partial^\phi \partial_\epsilon \partial^\epsilon \sigma^{\beta\delta}{}_{\delta}$	5
Total expected gauge generators:		12

$$S == \iiiint \Big(\mathcal{A}^{\alpha\beta\chi}\ \sigma_{\alpha\beta\chi} + \tfrac{1}{3} r_2 \big(4\, \partial_\beta \mathcal{A}_{\alpha\iota\theta} - 2\, \partial_\beta \mathcal{A}_{\alpha\theta\iota} + 2\, \partial_\beta \mathcal{A}_{\iota\theta\alpha} - \partial_\iota \mathcal{A}_{\alpha\beta\theta} + \partial_\theta \mathcal{A}_{\alpha\beta\iota} - 2\, \partial_\theta \mathcal{A}_{\alpha\iota\beta}\big) \partial^\theta \mathcal{A}^{\alpha\beta\iota} - \tfrac{1}{2} r_3 \big(\partial_\beta \mathcal{A}_{\iota}{}^{\theta}{}_{\theta}\, \partial^\iota \mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_\iota \mathcal{A}_{\beta}{}^{\theta}{}_{\theta}\, \partial^\iota \mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_\alpha \mathcal{A}^{\alpha\beta\iota}\, \partial_\theta \mathcal{A}_{\beta}{}^{\theta}{}_{\iota} - 2\, \partial^\iota \mathcal{A}^{\alpha\beta}{}_{\alpha}\, \partial_\theta \mathcal{A}_{\beta}{}^{\theta}{}_{\iota} + \partial_\alpha \mathcal{A}^{\alpha\beta\iota}\, \partial_\theta \mathcal{A}_{\iota}{}^{\theta}{}_{\beta} - 2\, \partial^\iota \mathcal{A}^{\alpha\beta}{}_{\alpha}\, \partial_\theta \mathcal{A}_{\iota}{}^{\theta}{}_{\beta} + 8\, \partial_\beta \mathcal{A}_{\iota\theta\alpha}\, \partial^\theta \mathcal{A}^{\alpha\beta\iota}\big) + r_5 \big(\partial_\iota \mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\, \partial^\theta \mathcal{A}^{\alpha\iota}{}_{\alpha} - \partial_\theta \mathcal{A}_{\iota}{}^{\kappa}{}_{\kappa}\, \partial^\theta \mathcal{A}^{\alpha\iota}{}_{\alpha} - (\partial_\alpha \mathcal{A}^{\alpha\iota\theta} - 2\, \partial^\theta \mathcal{A}^{\alpha\iota}{}_{\alpha})(\partial_\kappa \mathcal{A}_{\iota}{}^{\kappa}{}_{\theta} - \partial_\kappa \mathcal{A}_{\theta}{}^{\kappa}{}_{\iota})\big)\Big)[t,x,y,z]\, dz\, dy\, dx\, dt$$

	$\overset{\#1}{0}^{+}\mathcal{A}$	$\overset{\#1}{0}^{-}\mathcal{A}$
$\overset{\#1}{0}^{+}\mathcal{A}\dagger$	0	0
$\overset{\#1}{0}^{-}\mathcal{A}\dagger$	0	$k^2 r_2$

	$\overset{\#1}{0}^{+}\sigma$	$\overset{\#1}{0}^{-}\sigma$
$\overset{\#1}{0}^{+}\sigma\dagger$	0	0
$\overset{\#1}{0}^{-}\sigma\dagger$	0	$\frac{1}{k^2 r_2}$

	$\overset{\#1}{1}^{+}\sigma_{\alpha\beta}$	$\overset{\#2}{1}^{+}\sigma_{\alpha\beta}$	$\overset{\#1}{1}^{-}\sigma_{\alpha}$	$\overset{\#2}{1}^{-}\sigma_{\alpha}$
$\overset{\#1}{1}^{+}\sigma\dagger^{\alpha\beta}$	$\frac{1}{k^2 (2 r_3 + r_5)}$	0	0	0
$\overset{\#2}{1}^{+}\sigma\dagger^{\alpha\beta}$	0	0	0	0
$\overset{\#1}{1}^{-}\sigma\dagger^{\alpha}$	0	0	$\frac{2}{k^2 (r_3 + 2 r_5)}$	0
$\overset{\#2}{1}^{-}\sigma\dagger^{\alpha}$	0	0	0	0

	$\overset{\#1}{1}^{+}\mathcal{A}_{\alpha\beta}$	$\overset{\#2}{1}^{+}\mathcal{A}_{\alpha\beta}$	$\overset{\#1}{1}^{-}\mathcal{A}_{\alpha}$	$\overset{\#2}{1}^{-}\mathcal{A}_{\alpha}$
$\overset{\#1}{1}^{+}\mathcal{A}\dagger^{\alpha\beta}$	$k^2 (2 r_3 + r_5)$	0	0	0
$\overset{\#2}{1}^{+}\mathcal{A}\dagger^{\alpha\beta}$	0	0	0	0
$\overset{\#1}{1}^{-}\mathcal{A}\dagger^{\alpha}$	0	0	$\frac{1}{2} k^2 (r_3 + 2 r_5)$	0
$\overset{\#2}{1}^{-}\mathcal{A}\dagger^{\alpha}$	0	0	0	0

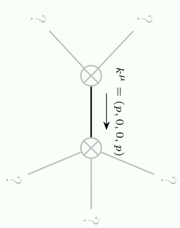
	$\overset{\#1}{2}^{+}\sigma_{\alpha\beta}$	$\overset{\#1}{2}^{-}\sigma_{\alpha\beta\chi}$
$\overset{\#1}{2}^{+}\sigma\dagger^{\alpha\beta}$	$-\frac{2}{3 k^2 r_3}$	0
$\overset{\#1}{2}^{-}\sigma\dagger^{\alpha\beta\chi}$	0	0

	$\overset{\#1}{2}^{+}\mathcal{A}_{\alpha\beta}$	$\overset{\#1}{2}^{-}\mathcal{A}_{\alpha\beta\chi}$
$\overset{\#1}{2}^{+}\mathcal{A}\dagger^{\alpha\beta}$	$-\frac{3 k^2 r_3}{2}$	0
$\overset{\#1}{2}^{-}\mathcal{A}\dagger^{\alpha\beta\chi}$	0	0

Massive and massless spectra

Pole residue:	$-\frac{1}{r_3 (2 r_3 + r_5)(r_3 + 2 r_5)} > 0$
Polarisations:	2

Massless particle



(No particles)

Unitarity conditions