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
$\overset{\#2}{1^-}\,\tau^{\alpha} + 2\,i\,k\,\overset{\#2}{1^-}\,\sigma^{\alpha} == 0$	$\partial_\chi\partial^\alpha\partial_\beta\tau^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta\tau^{\alpha\beta} + 2\,\partial_\delta\partial^\delta\partial_\chi\partial_\beta\sigma^{\alpha\beta\chi}$	3
$\overset{\#1}{1^-}\,\tau^{\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha\tau^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta\tau^{\beta\alpha}$	3
$\overset{\#1}{1^+}\,\tau^{\alpha\beta} + i\,k\,\overset{\#2}{1^+}\,\sigma^{\alpha\beta} == 0$	$\partial_\chi\partial^\alpha\tau^{\beta\chi} + \partial_\chi\partial^\beta\tau^{\chi\alpha} + \partial_\chi\partial^\chi\tau^{\alpha\beta} + 2\,\partial_\delta\partial^\alpha\sigma^{\beta\chi\delta} + 2\,\partial_\delta\partial^\delta\partial_\chi\sigma^{\alpha\beta\chi} == \partial_\chi\partial^\alpha\tau^{\chi\beta} + \partial_\chi\partial^\chi\tau^{\beta\alpha} + \partial_\chi\partial^\beta\tau^{\alpha\chi} + 2\,\partial_\delta\partial_\chi\partial^\beta\sigma^{\alpha\chi\delta}$	3
Total expected gauge generators:		10

	$\overset{\#1}{2^+}\mathcal{A}_{\alpha\beta}$	$\overset{\#1}{2^+}f_{\alpha\beta}$	$\overset{\#1}{2^-}\mathcal{A}_{\alpha\beta\chi}$
$\overset{\#1}{2^+}\mathcal{A}\dagger^{\alpha\beta}$	$\frac{t_1}{2}$	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0
$\overset{\#1}{2^+}f\dagger^{\alpha\beta}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	0	0
$\overset{\#1}{2^-}\mathcal{A}\dagger^{\alpha\beta\chi}$	0	0	$\frac{t_1}{2}$

	$\overset{\#1}{2^+}\sigma_{\alpha\beta}$	$\overset{\#1}{2^+}\tau_{\alpha\beta}$	$\overset{\#1}{2^-}\sigma_{\alpha\beta\chi}$
$\overset{\#1}{2^+}\sigma\dagger^{\alpha\beta}$	0	$-\frac{i\sqrt{2}}{k\,t_1}$	0
$\overset{\#1}{2^+}\tau\dagger^{\alpha\beta}$	$\frac{i\sqrt{2}}{k\,t_1}$	$-\frac{1}{k^2 t_1}$	0
$\overset{\#1}{2^-}\sigma\dagger^{\alpha\beta\chi}$	0	0	$\frac{2}{t_1}$

$$\mathcal{S} == \iiiint \big(f^{\alpha\beta}\,\tau_{\alpha\beta} + \mathcal{A}^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + t_1\,(\mathcal{A}_{\iota\zeta\theta}\,\mathcal{A}^{\iota\theta\zeta} + \mathcal{A}^{\iota\theta}{}_{\iota}\,\mathcal{A}_{\theta}{}^{\zeta}{}_{\zeta} + 2\,f^{\iota\theta}\,\partial_\theta\mathcal{A}_{\iota}{}^{\zeta}{}_{\zeta} - 2\,\partial_\theta\mathcal{A}^{\iota\theta}{}_{\iota} - 2\,f^{\iota\theta}\,\partial_\zeta\mathcal{A}_{\iota}{}^{\zeta}{}_{\theta} + 2\,f^{\iota}{}_{\iota}\,\partial_\zeta\mathcal{A}^{\theta\zeta}{}_{\theta})\big)[t,x,y,z]\,dz\,dy\,dx\,dt$$

	$\overset{\#1}{1^+}\sigma_{\alpha\beta}$	$\overset{\#2}{1^+}\sigma_{\alpha\beta}$	$\overset{\#1}{1^+}\tau_{\alpha\beta}$	$\overset{\#1}{1^-}\sigma_{\alpha}$	$\overset{\#2}{1^-}\sigma_{\alpha}$	$\overset{\#1}{1^-}\tau_{\alpha}$	$\overset{\#2}{1^-}\tau_{\alpha}$
$\overset{\#1}{1^+}\sigma\dagger^{\alpha\beta}$	0	$-\frac{\sqrt{2}}{t_1+k^2 t_1}$	$-\frac{i\sqrt{2}\,k}{t_1+k^2 t_1}$	0	0		0
$\overset{\#2}{1^+}\sigma\dagger^{\alpha\beta}$	$-\frac{\sqrt{2}}{t_1+k^2 t_1}$	$\frac{1}{(1+k^2)^2 t_1}$	$\frac{i\,k}{(1+k^2)^2 t_1}$	0	0		0
$\overset{\#1}{1^+}\tau\dagger^{\alpha\beta}$	$\frac{i\sqrt{2}\,k}{t_1+k^2 t_1}$	$-\frac{i\,k}{(1+k^2)^2 t_1}$	$\frac{k^2}{(1+k^2)^2 t_1}$	0	0		0
$\overset{\#1}{1^-}\sigma\dagger^{\alpha}$	0	0		0	$\frac{\sqrt{2}}{t_1+2k^2 t_1}$	0	$\frac{2\,i\,k}{t_1+2k^2 t_1}$
$\overset{\#2}{1^-}\sigma\dagger^{\alpha}$	0	0		$\frac{\sqrt{2}}{t_1+2k^2 t_1}$	$\frac{1}{(1+2k^2)^2 t_1}$	0	$\frac{i\sqrt{2}\,k}{(1+2k^2)^2 t_1}$
$\overset{\#1}{1^-}\tau\dagger^{\alpha}$	0	0		0	0		0
$\overset{\#2}{1^-}\tau\dagger^{\alpha}$	0	0		$-\frac{2\,i\,k}{t_1+2k^2 t_1}$	$-\frac{i\sqrt{2}\,k}{(1+2k^2)^2 t_1}$	0	$\frac{2k^2}{(1+2k^2)^2 t_1}$

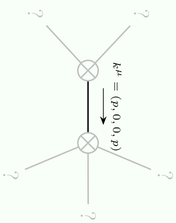
	$\overset{\#1}{1^+}\mathcal{A}_{\alpha\beta}$	$\overset{\#2}{1^+}\mathcal{A}_{\alpha\beta}$	$\overset{\#1}{1^+}f_{\alpha\beta}$	$\overset{\#1}{1^-}\mathcal{A}_{\alpha}$	$\overset{\#2}{1^-}\mathcal{A}_{\alpha}$	$\overset{\#1}{1^-}f_{\alpha}$	$\overset{\#2}{1^-}f_{\alpha}$
$\overset{\#1}{1^+}\mathcal{A}\dagger^{\alpha\beta}$	$-\frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0
$\overset{\#2}{1^+}\mathcal{A}\dagger^{\alpha\beta}$	$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\overset{\#1}{1^+}f\dagger^{\alpha\beta}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0	0	0
$\overset{\#1}{1^-}\mathcal{A}\dagger^{\alpha}$	0	0	0	$-\frac{t_1}{2}$	$\frac{t_1}{\sqrt{2}}$	0	$i\,k\,t_1$
$\overset{\#2}{1^-}\mathcal{A}\dagger^{\alpha}$	0	0	0	$\frac{t_1}{\sqrt{2}}$	0	0	0
$\overset{\#1}{1^-}f\dagger^{\alpha}$	0	0	0	0	0	0	0
$\overset{\#2}{1^-}f\dagger^{\alpha}$	0	0	0	$-i\,k\,t_1$	0	0	0

	$\overset{\#1}{0^+}\sigma$	$\overset{\#1}{0^+}\tau$	$\overset{\#2}{0^+}\tau$	$\overset{\#1}{0^-}\sigma$
$\overset{\#1}{0^+}\sigma\dagger$	0	$\frac{i}{\sqrt{2}\,k\,t_1}$	0	0
$\overset{\#1}{0^+}\tau\dagger$	$-\frac{i}{\sqrt{2}\,k\,t_1}$	$\frac{1}{2k^2 t_1}$	0	0
$\overset{\#2}{0^+}\tau\dagger$	0	0	0	0
$\overset{\#1}{0^-}\sigma\dagger$	0	0	0	$-\frac{1}{t_1}$

	$\overset{\#1}{0^+}\mathcal{A}$	$\overset{\#1}{0^+}f$	$\overset{\#2}{0^+}f$	$\overset{\#1}{0^-}\mathcal{A}$
$\overset{\#1}{0^+}\mathcal{A}\dagger$	$-t_1$	$i\sqrt{2}\,k\,t_1$	0	0
$\overset{\#1}{0^+}f\dagger$	$-i\sqrt{2}\,k\,t_1$	0	0	0
$\overset{\#2}{0^+}f\dagger$	0	0	0	0
$\overset{\#1}{0^-}\mathcal{A}\dagger$	0	0	0	$-t_1$

Massive and massless spectra

Massless particle	
Pole residue:	$-\frac{1}{t_1} > 0$
Polarisations:	2



(No particles)

Unitarity conditions