Particle spectrograph

Wave operator and propagator

Quadratic (free) Lagrangian density

$$
\begin{aligned}
&-\tfrac{1}{2} a_0 \Gamma^{\alpha\beta\chi}\Gamma_{\beta\chi\alpha}+\tfrac{1}{2} a_0 \Gamma^{\alpha}{}_{\alpha}{}^{\beta}\Gamma^{\chi}{}_{\beta\chi}+h^{\alpha\beta}\mathcal{T}_{\alpha\beta}+\Gamma^{\alpha\beta\chi}\Delta_{\alpha\beta\chi}-\tfrac{1}{2} a_0 \Gamma^{\alpha\beta\chi}\partial_\beta h_{\alpha\chi}-\\
&\tfrac{1}{4} a_0 \Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\beta h^{\chi}{}_{\chi}+\tfrac{1}{4} a_0 \Gamma^{\alpha\beta}{}_{\alpha}\partial_\beta h^{\chi}{}_{\chi}-\tfrac{1}{4} a_0 h^{\chi}{}_{\chi}\partial_\beta\Gamma^{\alpha}{}_{\alpha}{}^{\beta}+\tfrac{1}{4} a_0 h^{\chi}{}_{\chi}\partial_\beta\Gamma^{\alpha\beta}{}_{\alpha}-\\
&\tfrac{1}{2} a_0 h_{\alpha\chi}\partial_\beta\Gamma^{\alpha\beta\chi}+\tfrac{11}{2} a_1 \partial^\alpha\Gamma^{\chi\delta}{}_{\delta}\partial_\beta\Gamma_{\chi\alpha}{}^{\beta}+\tfrac{1}{2} a_1 \partial^\alpha\Gamma_{\chi\alpha}{}^{\beta}\partial_\beta\Gamma^{\chi\delta}{}_{\delta}-\\
&19 a_1 \partial^\alpha\Gamma^{\chi\delta}{}_{\chi}\partial_\beta\Gamma_{\delta\alpha}{}^{\beta}+\tfrac{1}{4} a_0 h^{\alpha\beta}\partial_\beta\partial_\alpha h^{\chi}{}_{\chi}-\tfrac{1}{8} a_0 \partial_\beta h^{\chi}{}_{\chi}\partial^\beta h^{\alpha}{}_{\alpha}+\\
&\tfrac{1}{2} a_0 \Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\chi h_{\beta}{}^{\chi}+\tfrac{1}{4} a_0 \partial^\beta h^{\alpha}{}_{\alpha}\partial_\chi h_{\beta}{}^{\chi}+\tfrac{37}{4} a_1 \partial_\beta\partial_\alpha h^{\delta}{}_{\delta}\partial_\chi\Gamma^{\alpha\beta\chi}+\\
&\tfrac{3}{4} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\chi\partial_\alpha h^{\delta}{}_{\delta}-\tfrac{1}{2} a_0 h^{\alpha\beta}\partial_\chi\partial_\beta h_{\alpha}{}^{\chi}+\tfrac{1}{4} a_0 h^{\alpha}{}_{\alpha}\partial_\chi\partial_\beta h^{\beta\chi}+\\
&\tfrac{1}{4} a_0 h^{\alpha\beta}\partial_\chi\partial^\chi h_{\alpha\beta}-\tfrac{1}{4} a_0 h^{\alpha}{}_{\alpha}\partial_\chi\partial^\chi h^{\beta}{}_{\beta}-\tfrac{1}{4} a_0 \partial_\beta h_{\alpha\chi}\partial^\chi h^{\alpha\beta}+\tfrac{1}{8} a_0 \partial_\chi h_{\alpha\beta}\partial^\chi h^{\alpha\beta}+\\
&\tfrac{1}{2} a_0 h_{\beta\chi}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\tfrac{1}{2} a_1 \partial_\beta\Gamma_{\chi}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\delta}{}_{\delta\chi}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}+\\
&\tfrac{1}{2} a_1 \partial_\chi\Gamma_{\beta}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\tfrac{1}{2} a_1 \partial_\chi\Gamma^{\delta}{}_{\beta\delta}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\tfrac{1}{2} a_1 \partial_\chi\Gamma^{\delta}{}_{\delta\beta}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\\
&\tfrac{3}{4} a_1 \partial_\chi\partial_\beta h^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}-\tfrac{11}{2} a_1 \partial_\beta\Gamma_{\chi}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}+\tfrac{19}{2} a_1 \partial_\beta\Gamma^{\delta}{}_{\chi\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}+\\
&\tfrac{11}{2} a_1 \partial_\chi\Gamma_{\beta}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}-\tfrac{1}{2} a_1 \partial_\chi\Gamma^{\delta}{}_{\beta\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}-\tfrac{37}{4} a_1 \partial_\chi\partial_\beta h^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}+\\
&a_1 \partial_\alpha\Gamma_{\chi}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\beta}-a_1 \partial_\chi\Gamma_{\alpha}{}^{\delta}{}_{\delta}\partial^\chi\Gamma^{\alpha\beta}{}_{\beta}-\tfrac{9}{2} a_1 \partial_\chi\partial_\beta h^{\delta}{}_{\delta}\partial^\chi\partial_\alpha h^{\alpha\beta}+\\
&\tfrac{17}{8} a_1 \partial_\chi\partial_\beta h^{\delta}{}_{\delta}\partial^\chi\partial^\beta h^{\alpha}{}_{\alpha}-\tfrac{1}{2} a_1 \partial_\chi\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\alpha\beta}{}^{\delta}-\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\alpha\chi}{}^{\delta}-\\
&\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\alpha}{}^{\delta}{}_{\chi}+\tfrac{19}{2} a_1 \partial_\chi\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\beta\alpha}{}^{\delta}+a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\Gamma_{\beta}{}^{\delta}{}_{\chi}+\\
&\tfrac{1}{2} a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\Gamma_{\chi\beta}{}^{\delta}+\tfrac{1}{2} a_1 \partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\Gamma_{\chi\beta}{}^{\delta}-\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\chi}{}^{\delta}{}_{\alpha}+\\
&\tfrac{1}{2} a_1 \partial^\chi\Gamma_{\beta\alpha}{}^{\beta}\partial_\delta\Gamma_{\chi}{}^{\delta\alpha}+a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\Gamma_{\chi}{}^{\delta}{}_{\beta}-\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\Gamma^{\chi}{}_{\chi}{}^{\delta}+\\
&a_1 \partial_\beta\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\Gamma^{\chi\delta}{}_{\chi}-\tfrac{1}{2} a_1 \partial_\beta\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\Gamma^{\chi\delta}{}_{\chi}-\tfrac{37}{4} a_1 \partial_\chi\Gamma^{\alpha\beta\chi}\partial_\delta\partial_\alpha h_{\beta}{}^{\delta}-\\
&\tfrac{3}{4} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\partial_\alpha h_{\chi}{}^{\delta}-\tfrac{37}{4} a_1 \partial_\chi\Gamma^{\alpha\beta\chi}\partial_\delta\partial_\beta h_{\alpha}{}^{\delta}+\tfrac{3}{8} a_1 \partial_\chi\partial^\chi h^{\alpha\beta}\partial_\delta\partial_\beta h_{\alpha}{}^{\delta}+\\
&\tfrac{37}{8} a_1 \partial_\alpha\partial^\chi h^{\alpha\beta}\partial_\delta\partial_\beta h_{\chi}{}^{\delta}+\tfrac{3}{4} a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\partial_\beta h_{\chi}{}^{\delta}+\tfrac{37}{4} a_1 \partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\partial_\beta h_{\chi}{}^{\delta}-\\
&\tfrac{3}{8} a_1 \partial^\chi\partial_\alpha h^{\alpha\beta}\partial_\delta\partial_\beta h_{\chi}{}^{\delta}+\tfrac{13}{4} a_1 \partial^\chi\partial^\beta h^{\alpha}{}_{\alpha}\partial_\delta\partial_\beta h_{\chi}{}^{\delta}-\tfrac{3}{4} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\partial_\chi h_{\alpha}{}^{\delta}-\\
&\tfrac{43}{8} a_1 \partial_\alpha\partial^\chi h^{\alpha\beta}\partial_\delta\partial_\chi h_{\beta}{}^{\delta}+\tfrac{3}{4} a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\partial_\chi h_{\beta}{}^{\delta}+\tfrac{37}{4} a_1 \partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\partial_\chi h_{\beta}{}^{\delta}+\\
&\tfrac{77}{8} a_1 \partial^\chi\partial_\alpha h^{\alpha\beta}\partial_\delta\partial_\chi h_{\beta}{}^{\delta}-\tfrac{29}{4} a_1 \partial^\chi\partial^\beta h^{\alpha}{}_{\alpha}\partial_\delta\partial_\chi h_{\beta}{}^{\delta}+a_1 \partial_\beta\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\partial_\chi h^{\chi\delta}-\\
&a_1 \partial_\beta\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\partial_\chi h^{\chi\delta}-\tfrac{1}{2} a_1 \partial_\beta\partial_\alpha h^{\alpha\beta}\partial_\delta\partial_\chi h^{\chi\delta}+a_1 \partial_\beta\partial^\beta h^{\alpha}{}_{\alpha}\partial_\delta\partial_\chi h^{\chi\delta}+\\
&\tfrac{37}{4} a_1 \partial_\chi\Gamma^{\alpha\beta\chi}\partial_\delta\partial^\delta h_{\alpha\beta}+\tfrac{17}{8} a_1 \partial_\chi\partial^\chi h^{\alpha\beta}\partial_\delta\partial^\delta h_{\alpha\beta}+\tfrac{3}{4} a_1 \partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\partial^\delta h_{\alpha\chi}+\\
&\tfrac{1}{4} a_1 \partial_\alpha\partial^\chi h^{\alpha\beta}\partial_\delta\partial^\delta h_{\beta\chi}-\tfrac{3}{4} a_1 \partial^\chi\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\partial^\delta h_{\beta\chi}-\tfrac{37}{4} a_1 \partial^\chi\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\partial^\delta h_{\beta\chi}-\\
&\tfrac{73}{8} a_1 \partial^\chi\partial_\alpha h^{\alpha\beta}\partial_\delta\partial^\delta h_{\beta\chi}+\tfrac{17}{4} a_1 \partial^\chi\partial^\beta h^{\alpha}{}_{\alpha}\partial_\delta\partial^\delta h_{\beta\chi}-a_1 \partial_\beta\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\partial_\delta\partial^\delta h^{\chi}{}_{\chi}+\\
&a_1 \partial_\beta\Gamma^{\alpha\beta}{}_{\alpha}\partial_\delta\partial^\delta h^{\chi}{}_{\chi}-\tfrac{1}{2} a_1 \partial_\beta\partial^\beta h^{\alpha}{}_{\alpha}\partial_\delta\partial^\delta h^{\chi}{}_{\chi}+\tfrac{1}{2} a_1 \partial_\alpha\Gamma_{\beta\chi\delta}\partial^\delta\Gamma^{\alpha\beta\chi}+\\
&a_1 \partial_\alpha\Gamma_{\beta\delta\chi}\partial^\delta\Gamma^{\alpha\beta\chi}+a_1 \partial_\alpha\Gamma_{\chi\beta\delta}\partial^\delta\Gamma^{\alpha\beta\chi}+\tfrac{1}{2} a_1 \partial_\alpha\Gamma_{\chi\delta\beta}\partial^\delta\Gamma^{\alpha\beta\chi}+\\
&a_1 \partial_\alpha\Gamma_{\delta\beta\chi}\partial^\delta\Gamma^{\alpha\beta\chi}+a_1 \partial_\alpha\Gamma_{\delta\chi\beta}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{1}{2} a_1 \partial_\beta\Gamma_{\alpha\chi\delta}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{1}{2} a_1 \partial_\beta\Gamma_{\alpha\delta\chi}\partial^\delta\Gamma^{\alpha\beta\chi}-\\
&\tfrac{1}{2} a_1 \partial_\beta\Gamma_{\chi\delta\alpha}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{3}{2} a_1 \partial_\beta\partial_\alpha h_{\chi\delta}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{1}{2} a_1 \partial_\chi\Gamma_{\alpha\beta\delta}\partial^\delta\Gamma^{\alpha\beta\chi}-\\
&\tfrac{1}{2} a_1 \partial_\chi\Gamma_{\beta\alpha\delta}\partial^\delta\Gamma^{\alpha\beta\chi}+a_1 \partial_\chi\Gamma_{\beta\delta\alpha}\partial^\delta\Gamma^{\alpha\beta\chi}+\tfrac{3}{2} a_1 \partial_\chi\partial_\alpha h_{\beta\delta}\partial^\delta\Gamma^{\alpha\beta\chi}-\\
&a_1 \partial_\delta\Gamma_{\alpha\beta\chi}\partial^\delta\Gamma^{\alpha\beta\chi}-a_1 \partial_\delta\Gamma_{\alpha\chi\beta}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{1}{2} a_1 \partial_\delta\Gamma_{\beta\alpha\chi}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{1}{2} a_1 \partial_\delta\Gamma_{\beta\chi\alpha}\partial^\delta\Gamma^{\alpha\beta\chi}-\\
&\tfrac{1}{2} a_1 \partial_\delta\Gamma_{\chi\beta\alpha}\partial^\delta\Gamma^{\alpha\beta\chi}+\tfrac{3}{2} a_1 \partial_\delta\partial_\beta h_{\alpha\chi}\partial^\delta\Gamma^{\alpha\beta\chi}-\tfrac{3}{2} a_1 \partial_\delta\partial_\chi h_{\alpha\beta}\partial^\delta\Gamma^{\alpha\beta\chi}-\\
&\tfrac{11}{2} a_1 \partial_\beta\Gamma_{\delta\alpha}{}^{\beta}\partial^\delta\Gamma^{\alpha\chi}{}_{\chi}-\tfrac{1}{2} a_1 \partial^\alpha\Gamma_{\delta\alpha}{}^{\beta}\partial^\delta\Gamma_{\beta}{}^{\chi}{}_{\chi}+\tfrac{1}{2} a_1 \partial_\beta\Gamma_{\delta\alpha}{}^{\beta}\partial^\delta\Gamma^{\chi\alpha}{}_{\chi}-\\
&\tfrac{3}{4} a_1 \partial_\beta\partial_\alpha h_{\chi\delta}\partial^\delta\partial^\chi h^{\alpha\beta}+\tfrac{3}{2} a_1 \partial_\chi\partial_\beta h_{\alpha\delta}\partial^\delta\partial^\chi h^{\alpha\beta}-\tfrac{3}{4} a_1 \partial_\delta\partial_\chi h_{\alpha\beta}\partial^\delta\partial^\chi h^{\alpha\beta}
\end{aligned}
$$

	$\Delta^{\#1}_{1^+\,\alpha\beta}$	$\Delta^{\#2}_{1^+\,\alpha\beta}$	$\Delta^{\#3}_{1^+\,\alpha\beta}$	$\Delta^{\#1}_{1^-\,\alpha}$	$\Delta^{\#2}_{1^-\,\alpha}$	$\Delta^{\#3}_{1^-\,\alpha}$	$\Delta^{\#4}_{1^-\,\alpha}$	$\Delta^{\#5}_{1^-\,\alpha}$	$\Delta^{\#6}_{1^-\,\alpha}$	$\mathcal{T}^{\#1}_{1^-\,\alpha}$
$\Delta^{\#1}_{1^+}\dagger^{\alpha\beta}$	0	$-\frac{2\sqrt{2}}{a_0}$	0	0	0	0	0	0	0	0
$\Delta^{\#2}_{1^+}\dagger^{\alpha\beta}$	$-\frac{2\sqrt{2}}{a_0}$	$\frac{2(a_0^2-14a_0a_1k^2-35a_1^2k^4)}{a_0^2(a_0-29a_1k^2)}$	$\frac{40\sqrt{2}a_1k^2}{a_0^2-29a_0a_1k^2}$	0	0	0	0	0	0	0
$\Delta^{\#3}_{1^+}\dagger^{\alpha\beta}$	0	$\frac{40\sqrt{2}a_1k^2}{a_0^2-29a_0a_1k^2}$	$\frac{4}{a_0-29a_1k^2}$	0	0	0	0	0	0	0
$\Delta^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	$\frac{2\sqrt{2}}{a_0}$	0	0	0	0	0
$\Delta^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	$\frac{2\sqrt{2}}{a_0}$	$\frac{2(a_0^2-30a_0a_1k^2+401a_1^2k^4)}{a_0^2(a_0-33a_1k^2)}$	$\frac{5\sqrt{\frac{2}{3}}a_1k^2(7a_0-236a_1k^2)}{a_0^2(a_0-33a_1k^2)}$	$-\frac{5\sqrt{\frac{10}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	$\frac{10a_1k^2(-11a_0+118a_1k^2)}{\sqrt{3}a_0^2(a_0-33a_1k^2)}$	$\frac{50\sqrt{\frac{2}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	0
$\Delta^{\#3}_{1^-}\dagger^{\alpha}$	0	0	0	0	$\frac{5\sqrt{\frac{2}{3}}a_1k^2(7a_0-236a_1k^2)}{a_0^2(a_0-33a_1k^2)}$	$\frac{-19a_0^2+472a_0a_1k^2+5120a_1^2k^4}{12a_0^2(a_0-33a_1k^2)}$	$\frac{\sqrt{5}(5a_0-164a_1k^2)}{12a_0(a_0-33a_1k^2)}$	$-\frac{a_0^2-118a_0a_1k^2+2560a_1^2k^4}{6\sqrt{2}a_0^2(a_0-33a_1k^2)}$	$-\frac{a_0-28a_1k^2}{6a_0^2-198a_0a_1k^2}$	0
$\Delta^{\#4}_{1^-}\dagger^{\alpha}$	0	0	0	0	$-\frac{5\sqrt{\frac{10}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	$\frac{\sqrt{5}(5a_0-164a_1k^2)}{12a_0(a_0-33a_1k^2)}$	$\frac{1}{12a_0-396a_1k^2}$	$-\frac{\sqrt{\frac{5}{2}}(a_0-82a_1k^2)}{6a_0(a_0-33a_1k^2)}$	$-\frac{\sqrt{5}}{6(a_0-33a_1k^2)}$	0
$\Delta^{\#5}_{1^-}\dagger^{\alpha}$	0	0	0	0	$\frac{10a_1k^2(-11a_0+118a_1k^2)}{\sqrt{3}a_0^2(a_0-33a_1k^2)}$	$-\frac{a_0^2-118a_0a_1k^2+2560a_1^2k^4}{6\sqrt{2}a_0^2(a_0-33a_1k^2)}$	$-\frac{\sqrt{\frac{5}{2}}(a_0-82a_1k^2)}{6a_0(a_0-33a_1k^2)}$	$\frac{17a_0^2-236a_0a_1k^2+1280a_1^2k^4}{6a_0^2(a_0-33a_1k^2)}$	$-\frac{7(a_0+2a_1k^2)}{3\sqrt{2}a_0(a_0-33a_1k^2)}$	0
$\Delta^{\#6}_{1^-}\dagger^{\alpha}$	0	0	0	0	$\frac{50\sqrt{\frac{2}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	$-\frac{a_0-28a_1k^2}{6a_0^2-198a_0a_1k^2}$	$-\frac{\sqrt{5}}{6(a_0-33a_1k^2)}$	$-\frac{7(a_0+2a_1k^2)}{3\sqrt{2}a_0(a_0-33a_1k^2)}$	$\frac{5}{3(a_0-33a_1k^2)}$	0
$\mathcal{T}^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0	0	0	0

	$\Gamma^{\#1}_{1^+\,\alpha\beta}$	$\Gamma^{\#2}_{1^+\,\alpha\beta}$	$\Gamma^{\#3}_{1^+\,\alpha\beta}$	$\Gamma^{\#1}_{1^-\,\alpha}$	$\Gamma^{\#2}_{1^-\,\alpha}$	$\Gamma^{\#3}_{1^-\,\alpha}$	$\Gamma^{\#4}_{1^-\,\alpha}$	$\Gamma^{\#5}_{1^-\,\alpha}$	$\Gamma^{\#6}_{1^-\,\alpha}$	$h^{\#1}_{1^-\,\alpha}$
$\Gamma^{\#1}_{1^+}\dagger^{\alpha\beta}$	$\frac{1}{4}(-a_0-15a_1k^2)$	$-\frac{a_0}{2\sqrt{2}}$	$5a_1k^2$	0	0	0	0	0	0	0
$\Gamma^{\#2}_{1^+}\dagger^{\alpha\beta}$	$-\frac{a_0}{2\sqrt{2}}$	0	0	0	0	0	0	0	0	0
$\Gamma^{\#3}_{1^+}\dagger^{\alpha\beta}$	$5a_1k^2$	0	$\frac{1}{4}(a_0-29a_1k^2)$	0	0	0	0	0	0	0
$\Gamma^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	$\frac{1}{4}(-a_0-3a_1k^2)$	$\frac{a_0}{2\sqrt{2}}$	$\frac{5}{2}\sqrt{3}a_1k^2$	$-\frac{5}{2}\sqrt{\frac{5}{3}}a_1k^2$	$5\sqrt{\frac{3}{2}}a_1k^2$	$-\frac{5a_1k^2}{\sqrt{3}}$	0
$\Gamma^{\#2}_{1^-}\dagger^{\alpha}$	0	0	0	$\frac{a_0}{2\sqrt{2}}$	0	0	0	0	0	0
$\Gamma^{\#3}_{1^-}\dagger^{\alpha}$	0	0	0	$\frac{5}{2}\sqrt{3}a_1k^2$	0	$-\frac{a_0}{3}$	$\frac{1}{6}\sqrt{5}(a_0-8a_1k^2)$	$-\frac{a_0}{6\sqrt{2}}$	$\frac{1}{6}(-a_0+20a_1k^2)$	0
$\Gamma^{\#4}_{1^-}\dagger^{\alpha}$	0	0	0	$-\frac{5}{2}\sqrt{\frac{5}{3}}a_1k^2$	0	$\frac{1}{6}\sqrt{5}(a_0-8a_1k^2)$	$\frac{1}{3}(a_0+7a_1k^2)$	$-\frac{1}{6}\sqrt{\frac{5}{2}}(a_0+16a_1k^2)$	$-\frac{1}{6}\sqrt{5}(a_0-5a_1k^2)$	0
$\Gamma^{\#5}_{1^-}\dagger^{\alpha}$	0	0	0	$5\sqrt{\frac{3}{2}}a_1k^2$	0	$-\frac{a_0}{6\sqrt{2}}$	$-\frac{1}{6}\sqrt{\frac{5}{2}}(a_0+16a_1k^2)$	$\frac{a_0}{3}$	$\frac{a_0+40a_1k^2}{6\sqrt{2}}$	0
$\Gamma^{\#6}_{1^-}\dagger^{\alpha}$	0	0	0	$-\frac{5a_1k^2}{\sqrt{3}}$	0	$\frac{1}{6}(-a_0+20a_1k^2)$	$-\frac{1}{6}\sqrt{5}(a_0-5a_1k^2)$	$\frac{a_0+40a_1k^2}{6\sqrt{2}}$	$\frac{5}{12}(a_0-17a_1k^2)$	0
$h^{\#1}_{1^-}\dagger^{\alpha}$	0	0	0	0	0	0	0	0	0	0

	$\Gamma^{\#1}_{3^-\,\alpha\beta\chi}$
$\Gamma^{\#1}_{3^-}\dagger^{\alpha\beta\chi}$	$\frac{1}{2}(-a_0-7a_1k^2)$

	$\Delta^{\#1}_{3^-\,\alpha\beta\chi}$
$\Delta^{\#1}_{3^-}\dagger^{\alpha\beta\chi}$	$-\frac{2}{a_0+7a_1k^2}$

	$\Gamma^{\#1}_{2^+\,\alpha\beta}$	$\Gamma^{\#2}_{2^+\,\alpha\beta}$	$\Gamma^{\#3}_{2^+\,\alpha\beta}$	$h^{\#1}_{2^+\,\alpha\beta}$	$\Gamma^{\#1}_{2^-\,\alpha\beta\chi}$	$\Gamma^{\#2}_{2^-\,\alpha\beta\chi}$
$\Gamma^{\#1}_{2^+}\dagger^{\alpha\beta}$	$\frac{1}{4}(a_0+11a_1k^2)$	$-5\sqrt{\frac{2}{3}}a_1k^2$	$\frac{5a_1k^2}{\sqrt{3}}$	$-\frac{11ia_1k^3}{4\sqrt{2}}$	0	0
$\Gamma^{\#2}_{2^+}\dagger^{\alpha\beta}$	$-5\sqrt{\frac{2}{3}}a_1k^2$	$\frac{1}{6}(-3a_0+a_1k^2)$	$-\frac{a_1k^2}{6\sqrt{2}}$	$\frac{5ia_1k^3}{\sqrt{3}}$	0	0
$\Gamma^{\#3}_{2^+}\dagger^{\alpha\beta}$	$\frac{5a_1k^2}{\sqrt{3}}$	$-\frac{a_1k^2}{6\sqrt{2}}$	$\frac{1}{12}(3a_0+a_1k^2)$	$-\frac{5ia_1k^3}{\sqrt{6}}$	0	0
$h^{\#1}_{2^+}\dagger^{\alpha\beta}$	$\frac{11ia_1k^3}{4\sqrt{2}}$	$-\frac{5ia_1k^3}{\sqrt{3}}$	$\frac{5ia_1k^3}{\sqrt{6}}$	$-\frac{1}{8}k^2(a_0-11a_1k^2)$	0	0
$\Gamma^{\#1}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0	0	$\frac{1}{4}(a_0-a_1k^2)$	0
$\Gamma^{\#2}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0	0	0	$\frac{1}{4}(a_0-5a_1k^2)$

Source constraints/gauge generators	
SO(3) irreps	Multiplicities
$\mathcal{T}^{\#2}_{0^+}==0$	1
$\Delta^{\#3}_{0^+}+2\Delta^{\#4}_{0^+}+3\Delta^{\#2}_{0^+}==0$	1
$\mathcal{T}^{\#1\,\alpha}_{1^-}==0$	3
$2\Delta^{\#6\,\alpha}_{1^-}+\Delta^{\#4\,\alpha}_{1^-}+2\Delta^{\#5\,\alpha}_{1^-}+\Delta^{\#3\,\alpha}_{1^-}==0$	3
Total constraints:	8

	$\Delta^{\#1}_{2^+\,\alpha\beta}$	$\Delta^{\#2}_{2^+\,\alpha\beta}$	$\Delta^{\#3}_{2^+\,\alpha\beta}$	$\mathcal{T}^{\#1}_{2^+\,\alpha\beta}$	$\Delta^{\#1}_{2^-\,\alpha\beta\chi}$	$\Delta^{\#2}_{2^-\,\alpha\beta\chi}$
$\Delta^{\#1}_{2^+}\dagger^{\alpha\beta}$	$\frac{4(a_0-11a_1k^2)}{a_0^2}$	$-\frac{40\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{80a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{44i\sqrt{2}a_1k}{a_0^2}$	0	0
$\Delta^{\#2}_{2^+}\dagger^{\alpha\beta}$	$-\frac{40\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{2(3a_0+a_1k^2)}{3a_0^2}$	$-\frac{2\sqrt{2}a_1k^2}{3a_0^2}$	$-\frac{80ia_1k}{\sqrt{3}a_0^2}$	0	0
$\Delta^{\#3}_{2^+}\dagger^{\alpha\beta}$	$-\frac{80a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{2\sqrt{2}a_1k^2}{3a_0^2}$	$\frac{4(3a_0-a_1k^2)}{3a_0^2}$	$-\frac{80i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	0	0
$\mathcal{T}^{\#1}_{2^+}\dagger^{\alpha\beta}$	$\frac{44i\sqrt{2}a_1k}{a_0^2}$	$\frac{80ia_1k}{\sqrt{3}a_0^2}$	$\frac{80i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	$-\frac{8(a_0+11a_1k^2)}{a_0^2k^2}$	0	0
$\Delta^{\#1}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0	0	$\frac{4}{a_0-a_1k^2}$	0
$\Delta^{\#2}_{2^-}\dagger^{\alpha\beta\chi}$	0	0	0	0	0	$\frac{4}{a_0-5a_1k^2}$

	$\Gamma^{\#1}_{0^+}$	$\Gamma^{\#2}_{0^+}$	$\Gamma^{\#3}_{0^+}$	$\Gamma^{\#4}_{0^+}$	$h^{\#1}_{0^+}$	$h^{\#2}_{0^+}$	$\Gamma^{\#1}_{0^-}$
$\Gamma^{\#1}_{0^+}\dagger$	$\frac{1}{2}(-a_0+25a_1k^2)$	0	$10\sqrt{\frac{2}{3}}a_1k^2$	$-\frac{10a_1k^2}{\sqrt{3}}$	$-\frac{25ia_1k^3}{2\sqrt{2}}$	0	0
$\Gamma^{\#2}_{0^+}\dagger$	0	0	$\frac{a_0}{2}$	$-\frac{a_0}{2\sqrt{2}}$	0	0	0
$\Gamma^{\#3}_{0^+}\dagger$	$10\sqrt{\frac{2}{3}}a_1k^2$	$\frac{a_0}{2}$	$\frac{23a_1k^2}{3}$	$-\frac{3a_0+46a_1k^2}{6\sqrt{2}}$	$-\frac{10ia_1k^3}{\sqrt{3}}$	0	0
$\Gamma^{\#4}_{0^+}\dagger$	$-\frac{10a_1k^2}{\sqrt{3}}$	$-\frac{a_0}{2\sqrt{2}}$	$-\frac{3a_0+46a_1k^2}{6\sqrt{2}}$	$\frac{1}{6}(3a_0+23a_1k^2)$	$5i\sqrt{\frac{2}{3}}a_1k^3$	0	0
$h^{\#1}_{0^+}\dagger$	$\frac{25ia_1k^3}{2\sqrt{2}}$	0	$\frac{10ia_1k^3}{\sqrt{3}}$	$-5i\sqrt{\frac{2}{3}}a_1k^3$	$\frac{1}{4}k^2(a_0+25a_1k^2)$	0	0
$h^{\#2}_{0^+}\dagger$	0	0	0	0	0	0	0
$\Gamma^{\#1}_{0^-}\dagger$	0	0	0	0	0	0	$\frac{1}{2}(-a_0+a_1k^2)$

	$\Delta^{\#1}_{0^+}$	$\Delta^{\#2}_{0^+}$	$\Delta^{\#3}_{0^+}$	$\Delta^{\#4}_{0^+}$	$\mathcal{T}^{\#1}_{0^+}$	$\mathcal{T}^{\#2}_{0^+}$	$\Delta^{\#1}_{0^-}$
$\Delta^{\#1}_{0^+}\dagger$	$-\frac{2(a_0+25a_1k^2)}{a_0^2}$	$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{50i\sqrt{2}a_1k}{a_0^2}$	0	0
$\Delta^{\#2}_{0^+}\dagger$	$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{3(a_0+23a_1k^2)}{4a_0^2}$	$\frac{5a_0+23a_1k^2}{4a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$\frac{20i\sqrt{3}a_1k}{a_0^2}$	0	0
$\Delta^{\#3}_{0^+}\dagger$	$-\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$\frac{5a_0+23a_1k^2}{4a_0^2}$	$-\frac{9a_0+23a_1k^2}{12a_0^2}$	$-\frac{3a_0+23a_1k^2}{6\sqrt{2}a_0^2}$	$-\frac{20ia_1k}{\sqrt{3}a_0^2}$	0	0
$\Delta^{\#4}_{0^+}\dagger$	$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$-\frac{3a_0+23a_1k^2}{6\sqrt{2}a_0^2}$	$\frac{3a_0-23a_1k^2}{6a_0^2}$	$-\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	0	0
$\mathcal{T}^{\#1}_{0^+}\dagger$	$\frac{50i\sqrt{2}a_1k}{a_0^2}$	$-\frac{20i\sqrt{3}a_1k}{a_0^2}$	$\frac{20ia_1k}{\sqrt{3}a_0^2}$	$\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	$\frac{4(a_0-25a_1k^2)}{a_0^2k^2}$	0	0
$\mathcal{T}^{\#2}_{0^+}\dagger$	0	0	0	0	0	0	0
$\Delta^{\#1}_{0^-}\dagger$	0	0	0	0	0	0	$-\frac{2}{a_0-a_1k^2}$

Massive and massless spectra

** MassiveAnalysisOfSector... Null

Unitarity conditions