Particle spectrograph

Wave operator and propagator

Quadratic (free) action
$S_{F} = F$
$\iiint \left(\frac{1}{8} \left(8 \ h^{\alpha\beta} \ \mathcal{T}_{\alpha\beta} - 4 \ \Gamma^{\alpha\beta\chi} \left(a_0 \ \Gamma_{\beta\chi\alpha} - 2 \ \Delta_{\alpha\beta\chi} + a_0 \ \partial_{\beta}h_{\alpha\chi}\right) + 2 \ a_0 \ \Gamma^{\alpha\beta}_{\alpha} \ \partial_{\beta}h^{\chi}_{\chi} - 2 \ \Delta_{\alpha\beta\chi} + a_0 \ \partial_{\beta}h_{\alpha\chi} \right) + 2 \ a_0 \ \Gamma^{\alpha\beta}_{\alpha} \ \partial_{\beta}h^{\chi}_{\chi} - 2 \ \Delta_{\alpha\beta\chi} + a_0 \ \partial_{\beta}h_{\alpha\chi} + a_0 \ \partial_$
$2 a_0 h_{\chi}^{\chi} \partial_{\beta} \Gamma_{\alpha}^{\alpha\beta} + 2 a_0 h_{\chi}^{\chi} \partial_{\beta} \Gamma_{\alpha}^{\alpha\beta} - 4 a_0 h_{\alpha\chi} \partial_{\beta} \Gamma_{\alpha}^{\alpha\beta\chi} + 44 a_1 \partial^{\alpha} \Gamma_{\delta}^{\chi\delta} \partial_{\beta} \Gamma_{\chi\alpha}^{\beta} +$
$4 a_1 \partial^{\alpha} \Gamma_{\chi \alpha}^{ \beta} \partial_{\beta} \Gamma^{\chi \delta}_{ \delta} - 152 a_1 \partial^{\alpha} \Gamma^{\chi \delta}_{ \chi} \partial_{\beta} \Gamma_{\delta \alpha}^{ \beta} + 2 a_0 h^{\alpha \beta} \partial_{\beta} \partial_{\alpha} h^{\chi}_{ \chi} -$
$a_0 \partial_\beta h^X_{\ \chi} \partial^\beta h^\alpha_{\ \alpha} + 2 a_0 \partial^\beta h^\alpha_{\ \alpha} \partial_\chi h^X_\beta + 2 a_0 \Gamma^\alpha_{\ \alpha}{}^\beta (2 \Gamma^X_{\ \beta\chi} - \partial_\beta h^X_{\ \chi} + 2 \partial_\chi h^X_\beta) +$
$74 a_1 \partial_{\beta} \partial_{\alpha} h^{\delta}_{ \delta} \partial_{\chi} \Gamma^{\alpha\beta\chi} + 6 a_1 \partial_{\beta} \Gamma^{\alpha\beta\chi} \partial_{\chi} \partial_{\alpha} h^{\delta}_{ \delta} - 4 a_0 h^{\alpha\beta} \partial_{\chi} \partial_{\beta} h_{\alpha}^{ \chi} +$
$2 a_0 h^{\alpha}_{\alpha} \partial_{\chi} \partial_{\beta} h^{\beta \chi} + 2 a_0 h^{\alpha \beta} \partial_{\chi} \partial^{\chi} h_{\alpha \beta} - 2 a_0 h^{\alpha}_{\alpha} \partial_{\chi} \partial^{\chi} h^{\beta}_{\beta} - 2 a_0 \partial_{\beta} h_{\alpha \chi} \partial^{\chi} h^{\alpha \beta} +$
$a_0\partial_\chi h_{\alpha\beta}\partial^\chi h^{\alpha\beta} + 4a_0h_{\beta\chi}\partial^\chi \Gamma^\alpha_{\ \alpha}{}^\beta - 4a_1\partial_\beta \Gamma^\delta_{\chi\ \delta}\partial^\chi \Gamma^\alpha_{\ \alpha}{}^\beta - 4a_1\partial_\beta \Gamma^\delta_{\ \delta\chi}\partial^\chi \Gamma^\alpha_{\ \alpha}{}^\beta +$
$4a_1\partial_\chi \Gamma_{\beta}^{\delta}\partial^\chi \Gamma_{\alpha}^{\beta} - 4a_1\partial_\chi \Gamma_{\delta}^{\delta}\partial^\chi \Gamma_{\alpha}^{\beta} - 4a_1\partial_\chi \Gamma_{\delta\beta}^{\delta}\partial^\chi \Gamma_{\alpha}^{\beta} -$
$6 a_1 \partial_{\chi} \partial_{\beta} h^{\delta}_{ \delta} \partial^{\chi} \Gamma^{\alpha}_{ \alpha}{}^{\beta} - 44 a_1 \partial_{\beta} \Gamma^{ \delta}_{ \delta} \partial^{\chi} \Gamma^{\alpha\beta}_{ \alpha} + 76 a_1 \partial_{\beta} \Gamma^{\delta}_{ \chi \delta} \partial^{\chi} \Gamma^{\alpha\beta}_{ \alpha} +$
$44a_1\partial_\chi \Gamma_{\beta\ \delta}^{\ \delta}\partial^\chi \Gamma^{\alpha\beta}_{\ \alpha} - 4a_1\partial_\chi \Gamma^{\delta}_{\ \beta\delta}\partial^\chi \Gamma^{\alpha\beta}_{\ \alpha} - 74a_1\partial_\chi\partial_\beta h^\delta_{\ \delta}\partial^\chi \Gamma^{\alpha\beta}_{\ \alpha} +$
$8 a_1 \partial_{\alpha} \Gamma_{\chi \delta}^{\delta} \partial^{\chi} \Gamma^{\alpha\beta}_{\beta} - 8 a_1 \partial_{\chi} \Gamma_{\alpha \delta}^{\delta} \partial^{\chi} \Gamma^{\alpha\beta}_{\beta} - 36 a_1 \partial_{\chi} \partial_{\beta} h^{\delta}_{\delta} \partial^{\chi} \partial_{\alpha} h^{\alpha\beta} +$
$17a_1\partial_\chi\partial_\beta h^\delta_{\delta}\partial^\chi\partial^\beta h^\alpha_{\alpha} - 4a_1\partial_\chi \Gamma^{\alpha\beta\chi}\partial_\delta \Gamma_{\alpha\beta}^{\delta} - 4a_1\partial_\beta \Gamma^{\alpha\beta\chi}\partial_\delta \Gamma_{\alpha\chi}^{\delta} -$
$4 a_1 \partial_{\beta} \Gamma^{\alpha\beta\chi} \partial_{\delta} \Gamma_{\alpha \chi}^{\ \delta} + 76 a_1 \partial_{\chi} \Gamma^{\alpha\beta\chi} \partial_{\delta} \Gamma_{\beta\alpha}^{\ \delta} + 8 a_1 \partial^{\chi} \Gamma_{\alpha}^{\alpha \beta} \partial_{\delta} \Gamma_{\beta \chi}^{\ \delta} +$
$4a_1\partial^\chi\Gamma^\alpha_{\alpha}{}^\beta\partial_\delta\Gamma_{\chi\beta}^{\delta} + 4a_1\partial^\chi\Gamma^{\alpha\beta}_{\alpha}\partial_\delta\Gamma_{\chi\beta}^{\delta} - 4a_1\partial_\beta\Gamma^{\alpha\beta\chi}\partial_\delta\Gamma_{\chi\alpha}^{\delta} +$
$4a_1\partial^\chi \Gamma_{\beta\alpha}^{\beta}\partial_\delta \Gamma_{\chi}^{\delta\alpha} + 8a_1\partial^\chi \Gamma_{\alpha}^{\beta}\partial_\delta \Gamma_{\chi\beta}^{\delta} - 4a_1\partial_\beta \Gamma_{\alpha}^{\beta}\partial_\delta \Gamma_{\chi}^{\delta} +$
$8a_1\partial_\beta \Gamma^\alpha_{\alpha}{}^\beta\partial_\delta \Gamma^{\chi\delta}_{\zeta} - 4a_1\partial_\beta \Gamma^{\alpha\beta}_{\alpha}\partial_\delta \Gamma^{\chi\delta}_{\zeta} - 74a_1\partial_\chi \Gamma^{\alpha\beta\chi}\partial_\delta\partial_\alpha h_\beta^{\delta} -$
$6 a_1 \partial_{\beta} \Gamma^{\alpha\beta\chi} \partial_{\delta} \partial_{\alpha} h_{\chi}^{\delta} - 74 a_1 \partial_{\chi} \Gamma^{\alpha\beta\chi} \partial_{\delta} \partial_{\beta} h_{\alpha}^{\delta} + 3 a_1 \partial_{\chi} \partial^{\chi} h^{\alpha\beta} \partial_{\delta} \partial_{\beta} h_{\alpha}^{\delta} +$
$37 a_1 \partial_{\alpha} \partial^{\chi} h^{\alpha\beta} \partial_{\delta} \partial_{\beta} h_{\chi}^{\delta} + 6 a_1 \partial^{\chi} \Gamma^{\alpha}_{\alpha}{}^{\beta} \partial_{\delta} \partial_{\beta} h_{\chi}^{\delta} + 74 a_1 \partial^{\chi} \Gamma^{\alpha\beta}_{\alpha} \partial_{\delta} \partial_{\beta} h_{\chi}^{\delta} -$
$3 a_1 \partial^{\chi} \partial_{\alpha} h^{\alpha\beta} \partial_{\delta} \partial_{\beta} h_{\chi}^{\delta} + 26 a_1 \partial^{\chi} \partial^{\beta} h^{\alpha}_{\alpha} \partial_{\delta} \partial_{\beta} h_{\chi}^{\delta} - 6 a_1 \partial_{\beta} \Gamma^{\alpha\beta\chi} \partial_{\delta} \partial_{\chi} h_{\alpha}^{\delta} -$
$43 a_1 \partial_{\alpha} \partial^{\chi} h^{\alpha\beta} \partial_{\delta} \partial_{\chi} h_{\beta}^{\delta} + 6 a_1 \partial^{\chi} \Gamma^{\alpha}_{\alpha}{}^{\beta} \partial_{\delta} \partial_{\chi} h_{\beta}^{\delta} + 74 a_1 \partial^{\chi} \Gamma^{\alpha\beta}_{\alpha} \partial_{\delta} \partial_{\chi} h_{\beta}^{\delta} +$
$77 a_1 \partial^{\chi} \partial_{\alpha} h^{\alpha\beta} \partial_{\delta} \partial_{\chi} h_{\beta}^{\ \delta} - 58 a_1 \partial^{\chi} \partial^{\beta} h^{\alpha}_{\ \alpha} \partial_{\delta} \partial_{\chi} h_{\beta}^{\ \delta} + 8 a_1 \partial_{\beta} \Gamma^{\alpha}_{\ \alpha}{}^{\beta} \partial_{\delta} \partial_{\chi} h^{\chi\delta} -$
$8 a_1 \partial_{\beta} \Gamma^{\alpha\beta}_{\alpha} \partial_{\delta} \partial_{\chi} h^{\chi\delta} - 4 a_1 \partial_{\beta} \partial_{\alpha} h^{\alpha\beta} \partial_{\delta} \partial_{\chi} h^{\chi\delta} + 8 a_1 \partial_{\beta} \partial^{\beta} h^{\alpha}_{\alpha} \partial_{\delta} \partial_{\chi} h^{\chi\delta} +$
$74a_1\partial_\chi \Gamma^{\alpha\beta\chi}\partial_\delta\partial^\delta h_{\alpha\beta} + 17a_1\partial_\chi\partial^\chi h^{\alpha\beta}\partial_\delta\partial^\delta h_{\alpha\beta} + 6a_1\partial_\beta \Gamma^{\alpha\beta\chi}\partial_\delta\partial^\delta h_{\alpha\chi} +$
$2a_1\partial_\alpha\partial^\chi h^{\alpha\beta}\partial_\delta\partial^\delta h_{\beta\chi} - 6a_1\partial^\chi \Gamma^\alpha_{\ \alpha}{}^\beta\partial_\delta\partial^\delta h_{\beta\chi} - 74a_1\partial^\chi \Gamma^{\alpha\beta}_{\ \alpha}\partial_\delta\partial^\delta h_{\beta\chi} -$
$73 a_1 \partial^{\chi} \partial_{\alpha} h^{\alpha\beta} \partial_{\delta} \partial^{\delta} h_{\beta\chi} + 34 a_1 \partial^{\chi} \partial^{\beta} h^{\alpha}_{\alpha} \partial_{\delta} \partial^{\delta} h_{\beta\chi} - 8 a_1 \partial_{\beta} \Gamma^{\alpha}_{\alpha}{}^{\beta} \partial_{\delta} \partial^{\delta} h^{\chi}_{\chi} +$
$8 a_1 \partial_{\beta} \Gamma^{\alpha\beta}_{\alpha} \partial_{\delta} \partial^{\delta} h^{\chi}_{\chi} - 4 a_1 \partial_{\beta} \partial^{\beta} h^{\alpha}_{\alpha} \partial_{\delta} \partial^{\delta} h^{\chi}_{\chi} + 4 a_1 \partial_{\alpha} \Gamma_{\beta \chi \delta} \partial^{\delta} \Gamma^{\alpha \beta \chi} +$
$8 a_1 \partial_\alpha \Gamma_{\beta \delta \chi} \partial^\delta \Gamma^{\alpha \beta \chi} + 8 a_1 \partial_\alpha \Gamma_{\chi \beta \delta} \partial^\delta \Gamma^{\alpha \beta \chi} + 4 a_1 \partial_\alpha \Gamma_{\chi \delta \beta} \partial^\delta \Gamma^{\alpha \beta \chi} +$
$8 a_1 \partial_{\alpha} \Gamma_{\delta\beta\chi} \partial^{\delta} \Gamma^{\alpha\beta\chi} + 8 a_1 \partial_{\alpha} \Gamma_{\delta\chi\beta} \partial^{\delta} \Gamma^{\alpha\beta\chi} - 4 a_1 \partial_{\beta} \Gamma_{\alpha\chi\delta} \partial^{\delta} \Gamma^{\alpha\beta\chi} -$
$4 a_1 \partial_{\beta} \Gamma_{\alpha \delta \chi} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 4 a_1 \partial_{\beta} \Gamma_{\chi \delta \alpha} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 12 a_1 \partial_{\beta} \partial_{\alpha} h_{\chi \delta} \partial^{\delta} \Gamma^{\alpha \beta \chi} -$
$4 a_1 \partial_{\chi} \Gamma_{\alpha\beta\delta} \partial^{\delta} \Gamma^{\alpha\beta\chi} - 4 a_1 \partial_{\chi} \Gamma_{\beta\alpha\delta} \partial^{\delta} \Gamma^{\alpha\beta\chi} + 8 a_1 \partial_{\chi} \Gamma_{\beta\delta\alpha} \partial^{\delta} \Gamma^{\alpha\beta\chi} +$
$12 a_1 \partial_{\chi} \partial_{\alpha} h_{\beta \delta} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 8 a_1 \partial_{\delta} \Gamma_{\alpha \beta \chi} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 8 a_1 \partial_{\delta} \Gamma_{\alpha \chi \beta} \partial^{\delta} \Gamma^{\alpha \beta \chi} -$
$4 a_1 \partial_{\delta} \Gamma_{\beta \alpha \chi} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 4 a_1 \partial_{\delta} \Gamma_{\beta \chi \alpha} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 4 a_1 \partial_{\delta} \Gamma_{\chi \beta \alpha} \partial^{\delta} \Gamma^{\alpha \beta \chi} +$
$12 a_1 \partial_{\delta} \partial_{\beta} h_{\alpha \chi} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 12 a_1 \partial_{\delta} \partial_{\chi} h_{\alpha \beta} \partial^{\delta} \Gamma^{\alpha \beta \chi} - 44 a_1 \partial_{\beta} \Gamma_{\delta \alpha}^{\ \beta} \partial^{\delta} \Gamma^{\alpha \chi}_{\ \chi} -$
$4 a_1 \partial^{\alpha} \Gamma_{\delta \alpha}^{\ \beta} \partial^{\delta} \Gamma_{\beta \chi}^{\ \chi} + 4 a_1 \partial_{\beta} \Gamma_{\delta \alpha}^{\ \beta} \partial^{\delta} \Gamma^{\chi \alpha}_{\ \chi} - 6 a_1 \partial_{\beta} \partial_{\alpha} h_{\chi \delta} \partial^{\delta} \partial^{\chi} h^{\alpha \beta} +$
$12 a_1 \partial_{\chi} \partial_{\beta} h_{\alpha \delta} \partial^{\delta} \partial^{\chi} h^{\alpha \beta} - 6 a_1 \partial_{\delta} \partial_{\chi} h_{\alpha \beta} \partial^{\delta} \partial^{\chi} h^{\alpha \beta}))[t, x, y, z] dz dy dx dt$

${\mathcal T}_{1^{\bar{-}}}^{\#1}{}_{\alpha}$	0	0	0	0	$\frac{\lambda^2}{\kappa^2}$ 0	$\frac{2}{a_1 k^2}$ 0	$\frac{1}{k^2}$ 0	$\frac{k^2}{(a_1 k^2)}$ 0	(2)	0
$\Delta_{1^{-}\alpha}^{\#6}$	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
$\Delta_{1}^{\#5}{}_{\alpha}$	0	0	0	0	$\frac{10a_1 k^2 (-11a_0 + 118a_1 k^2)}{\sqrt{3} a_0^2 (a_0 - 33a_1 k^2)}$	$-\frac{a_0^2 - 118 a_0 a_1 k^2 + 2560 a_1^2 k^4}{6 \sqrt{2} a_0^2 (a_0 - 33 a_1 k^2)}$	$-\frac{\sqrt{\frac{5}{2}} (a_0-82 a_1 k^2)}{6 a_0 (a_0-33 a_1 k^2)}$	$\frac{17a_0^2 - 236a_0a_1k^2 + 1280a_1^2k^4}{6a_0^2(a_0 - 33a_1k^2)}$	$-\frac{7(a_0+2a_1k^2)}{3\sqrt{2}a_0(a_0-33a_1k^2)}$	0
$\Delta_{1^-}^{\#4}{}_{\alpha}$	0	0	0	0	$-\frac{5\sqrt{\frac{10}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	$\frac{\sqrt{5} (5a_0 - 164a_1 k^2)}{12 a_0 (a_0 - 33 a_1 k^2)}$	$\frac{1}{12a_0.396a_1k^2}$	$-\frac{\sqrt{\frac{5}{2}} (a_0-82 a_1 k^2)}{6 a_0 (a_0-33 a_1 k^2)}$	$-\frac{\sqrt{5}}{6(a_0-33a_1k^2)}$	0
$\Delta_{1}^{\#3}{}_{\alpha}$	0	0	0	0	$\frac{5\sqrt{\frac{2}{3}}a_1k^2(7a_0-236a_1k^2)}{a_0^2(a_0-33a_1k^2)}$	$\frac{-19a_0^2 + 472a_0a_1k^2 + 5120a_1^2k^4}{12a_0^2(a_0 - 33a_1k^2)}$	$\frac{\sqrt{5} (5 a_0 - 164 a_1 k^2)}{12 a_0 (a_0 - 33 a_1 k^2)}$	$-\frac{a_0^2 - 118 a_0 a_1 k^2 + 2560 a_1^2 k^4}{6 \sqrt{2} a_0^2 (a_0 - 33 a_1 k^2)}$	$-\frac{a_0 - 28a_1 k^2}{6a_0^2 - 198a_0 a_1 k^2}$	0
$\Delta_{1^{-}\alpha}^{\#2}$	0	0	0	$\frac{2\sqrt{2}}{a_0}$	$\frac{2(a_0^2 - 30a_0a_1k^2 + 401a_1^2k^4)}{a_0^2(a_0 - 33a_1k^2)}$	$\frac{5\sqrt{\frac{2}{3}}a_1k^2(7a_0-236a_1k^2)}{a_0^2(a_0-33a_1k^2)}$	$-\frac{5\sqrt{\frac{10}{3}}a_1k^2}{a_0^2-33a_0a_1k^2}$	$\frac{10a_1 k^2 (-11 a_0 + 118 a_1 k^2)}{\sqrt{3} a_0^2 (a_0 - 33 a_1 k^2)}$	$\frac{50 \sqrt{\frac{2}{3}} a_1 k^2}{a_0^2 - 33 a_0 a_1 k^2}$	0
$\Delta_{1^{^{-}}}^{\#1}{}_{\alpha}$	0	0	0	0	$\frac{2\sqrt{2}}{a_0}$	0	0	0	0	0
$\Delta_{1}^{\#3}{}_{\alpha\beta}$	0	$\frac{40\sqrt{2}a_1k^2}{a_0^2-29a_0a_1k^2}$	$\frac{4}{a_0 - 29a_1 k^2}$	0	0	0	0	0	0	0
$\Delta_{1}^{\#2}$	$-\frac{2\sqrt{2}}{a_0}$	$\frac{2 \left(a_0^2 - 14 a_0 a_1 k^2 - 35 a_1^2 k^4\right)}{a_0^2 \left(a_0 - 29 a_1 k^2\right)}$	$\frac{40 \sqrt{2} a_1 k^2}{a_0^{2} - 29 a_0 a_1 k^2}$	0	0	0	0	0	0	0
$\Delta_{1}^{\#1}{}_{\alpha\beta}$	$\Delta_{1}^{#1} +^{\alpha \beta}$ 0	$\Delta_{1}^{#2} + \alpha \beta - \frac{2\sqrt{2}}{a_0}$	$\Delta_{1}^{#3} +^{\alpha \beta}$ 0	$\Delta_{1}^{\#1} +^{\alpha}$ 0	$\Delta_{1}^{#2} +^{\alpha}$ 0	$\Delta_1^{\#3} +^{\alpha} = 0$	$\Delta_{1}^{\#4} + ^{\alpha} = 0$	$\Delta_1^{\#5} +^{\alpha} = 0$	$\Delta_{1}^{\#6} +^{\alpha} = 0$	$\mathcal{T}_{1}^{\#1} \dagger^{\alpha} = 0$

$\Gamma_{3^{-} \alpha\beta\chi}^{\#1} \uparrow^{\alpha\beta\chi} \frac{\frac{1}{2} (-a_0 - 7 a_1 k^2)}{\frac{1}{2} (-a_0 - 7 a_1 k^2)}$						· † ^{αβχ}	$\Delta_3^{\#1}$ $-\frac{2}{a_0+7}$			
$h_{1}^{#1}$	0	0	0	0	0	0	0	0	0	0
$\Gamma_{1}^{\#6}$	0	0	0	$-\frac{5a_1k^2}{\sqrt{3}}$	0	$\frac{1}{6} \left(-a_0 + 20 a_1 k^2 \right)$	$-\frac{1}{6}\sqrt{5}(a_0-5a_1k^2)$	$\frac{a_0+40a_1k^2}{6\sqrt{2}}$	$\frac{5}{12}(a_0-17a_1k^2)$	0
$\Gamma_{1-\alpha}^{\#5}$	0	0	0	$5\sqrt{\frac{3}{2}}a_1k^2$	0	$-\frac{a_0}{6\sqrt{2}}$	$-\frac{1}{6} \sqrt{\frac{5}{2}} \left(a_0 + 16 a_1 k^2 \right)$	3 3	$\frac{a_0 + 40a_1 k^2}{6 \sqrt{2}}$	0
$\Gamma_1^{\#4}$	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
$\Gamma_{1}^{\#3}$	0	0	0	$\frac{5}{2}\sqrt{3}a_1k^2$	0	3 3	$\frac{1}{6}\sqrt{5}(a_0-8a_1k^2)$	$\frac{a_0}{6\sqrt{2}}$	$\frac{1}{6} \left(-a_0 + 20 a_1 k^2 \right)$	0
$\Gamma_{1}^{\#2}$	0	0	0	$\frac{a_0}{2\sqrt{2}}$	0	0	0	0	0	0
$\Gamma_{1^{-}\alpha}^{\#1}$	0	0	0	$\frac{1}{4} (-a_0 - 3 a_1 k^2)$	$\frac{a_0}{2\sqrt{2}}$	$\frac{5}{2}\sqrt{3}a_1k^2$	$-\frac{5}{2}\sqrt{\frac{5}{3}}a_1k^2$	$5\sqrt{\frac{3}{2}}a_1k^2$	$-\frac{5a_1k^2}{\sqrt{3}}$	0
$\Gamma_1^{\#3}$	$5a_1k^2$	0	$\frac{1}{4} (a_0 - 29 a_1 k^2)$	0	0	0	0	0	0	0
$\Gamma_{1}^{\#2}$	$-\frac{a_0}{2\sqrt{2}}$	0	0	0	0	0	0	0	0	0
$\Gamma_{1}^{\#1}_{\alpha\beta}$	$\frac{1}{4}$ (-a	$-\frac{a_0}{2\sqrt{2}}$	$5a_1k^2$	0	0	0	0	0	0	0
	$\frac{1}{1} + \alpha \beta$	$\pm \alpha \beta$	$^{\frac{3}{4}} + ^{\alpha\beta}$	$ \hat{a}^{\dagger} + \alpha$	$\frac{#2}{1}$ $+^{\alpha}$	$_{1}^{+3}$ $+^{\alpha}$	#4 †α	±2+α	π ₋ + α 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	$_{\scriptscriptstyle L^{-1}}^{\sharp_1} \dagger^{\alpha}$

								ors M		3	ε α	<u>)</u>
								ige generat			$^{\chi} + \Delta_{1}^{\#3}\alpha = 0$	
F#2	0	0	0	0	0	$\frac{1}{4} (a_0 - 5 a_1 k^2)$		Source constraints/gauge generators SO(3) irrens		$\lambda_{0+}^{#4} + 3 \Delta_{0+}^{#2} == 0$	$2 \Delta_{1}^{\#6}\alpha + \Delta_{1}^{\#4}\alpha + 2 \Delta_{1}^{\#5}\alpha +$ Total constraints:	
Γ#1 Γ2- αβν	0	0	0	0	$\frac{1}{4} (a_0 - a_1 k^2)$	0	,	Source cons SO(3) irrens	$T_{0+}^{#2} == 0$	$\Delta_{0}^{#3} + 2 \Delta_{0}^{#4} + \Delta_{0}^{#4} + \Delta_{0}^{#1} = 0$	$2 \Delta_{1}^{\#6} \alpha + 1$ Total cons	
$h_{2+\alpha\beta}^{*1}$	$\frac{11ia_1k^3}{4\sqrt{2}}$	$\frac{5ia_1k^3}{\sqrt{3}}$	$-\frac{5ia_1k^3}{\sqrt{6}}$	$\frac{1}{8}k^2(a_0-11a_1k^2)$	0	0		$^{1}_{\chi}$ $\Delta_{2}^{#2}$ $^{2}_{\alpha\beta\chi}$	0	0	0	C
	, 			$-\frac{1}{8}k^{2}$ (a				$\Delta_{2^{-}}^{\#1}\alpha\beta\chi$	0	0	0	2)
[#3 2+ 38	$\frac{5a_1k^2}{\sqrt{3}}$	$-\frac{a_1 k^2}{6 \sqrt{2}}$	$\frac{1}{2}(3a_0+a_1k^2)$	$\frac{5ia_1k^3}{\sqrt{6}}$	0	0		${\cal T}_{2}^{\#1}$	$-\frac{44i\sqrt{2}a_1k}{a_0^2}$	$-\frac{80ia_1k}{\sqrt{3}a_0^2}$	$80i\sqrt{\frac{2}{3}}a_1k$	8 (40
F#2	$-5\sqrt{\frac{2}{3}}a_1k^2$	$\frac{1}{6} \left(-3 a_0 + a_1 k^2 \right)$	$-\frac{a_1 k^2}{6 \sqrt{2}} \qquad \frac{1}{12}$	$\frac{5ia_1k^3}{\sqrt{3}}$	0	0		$\Delta_{2}^{\#3}$	$\begin{bmatrix} \frac{80a_1k^2}{\sqrt{3}a_0^2} \end{bmatrix}$	$\frac{2}{3a_0^2}$	$\frac{4(3a_0-a_1k^2)}{3a_0^2}$	$80 i \sqrt{\frac{2}{3}} a_1 k$
_				-"1				$\Delta_2^{\#2}_+ \alpha\beta$	$40 \sqrt{\frac{2}{3}} a_1 k^2 $ a_0^2	$\frac{2(3a_0 + a_1 k^2)}{3a_0^2}$	$-\frac{2\sqrt{2}a_1k^2}{3a_0^2}$	80 i a 1 k
#1 2+ 28	$\frac{1}{4}(a_0)$	$-5\sqrt{\frac{2}{3}}a_1k^2$	$\frac{5a_1k^2}{\sqrt{3}}$	$\frac{11ia_1k^3}{4\sqrt{2}}$	0	0		$\Delta_{2}^{\#1}{}_{+}\alpha\beta$	$\frac{4(a_0-11a_1k^2)}{a_0^2}$	$\frac{40\sqrt{\frac{2}{3}}a_1k^2}{a_0^2} = \frac{a_0^2}{a_0^2}$	0 0	44 i √2 a ₁ k
	$\Gamma_{2}^{#1} + \alpha \beta$	$\Gamma_2^{#2} + \alpha \beta$	$\Gamma_{2}^{#3} + \alpha \beta$	$h_{2}^{\#1} + \alpha \beta$	$\Gamma_2^{#1} +^{\alpha\beta\chi}$	$\Gamma_2^{#2} + \alpha \beta \chi$		•	$\Delta_2^{\#1} + \alpha \beta$	$\Delta_{2}^{#2} + \tau^{\alpha\beta}$	$\Delta_2^{#3} +^{\alpha\beta}$	$\sigma^{*1} + \alpha \beta$
		Γ ₀ -	1 +	Γ# ₀ .	2 +	Γ ₀ #	3		Γ#4 0+			$h_{0}^{\#1}$
Γ	$^{#1}_{0^+} + \frac{1}{2}$ ($-a_0 + 2$			10	Γ <u>-</u>			$-\frac{10 a_1}{\sqrt{3}}$		-	$\frac{25 i a_1}{2 \sqrt{2}}$
Γ#2 +						<u>a</u> 0			<u>_</u> <u>a</u> 0	0		

 $\left| -\frac{a_0}{2\sqrt{2}} \right| -\frac{3a_0 + 46a_1 k^2}{6\sqrt{2}}$

 $-\frac{3 a_0 + 46 a_1 k^2}{6 \sqrt{2}}$

 $\frac{1}{6} (3 a_0 + 23 a_1 k^2)$

 $-5\,i\,\sqrt{\tfrac{2}{3}}\,a_1\,k^3$

 $-\frac{10 i a_1 k^3}{\sqrt{3}}$

 $5 i \sqrt{\frac{2}{3}} a_1 k^3$

 $\left| \frac{1}{4} k^2 \left(a_0 + 25 a_1 k^2 \right) \right| 0$

 $0 \quad \frac{1}{2} \left(-a_0 + a_1 \, k^2 \right)$

 $10\sqrt{\frac{2}{3}}a_1k^2$

Γ₀^{#3} †

Γ₀^{#4} †

0 0

0 0

$\Delta_{0}^{\#1}$	0	0	0	0	0	0	$-\frac{2}{a_0 \cdot a_1 k^2}$
$\mathcal{T}_{0}^{\#2}$	0	0	0	0	0	0	0
${\mathcal T}_{0}^{\#1}$	$-\frac{50i\sqrt{2}a_1k}{a_0^2}$	$\frac{20i\sqrt{3}a_1k}{a_0^2}$	$-\frac{20ia_1k}{\sqrt{3}a_0^2}$	$-\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	$\frac{4(a_0-25a_1k^2)}{a_0^2k^2}$	0	0
$\Delta_{0}^{\#4}$	$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$-\frac{3a_0+23a_1k^2}{6\sqrt{2}a_0^2}$	$\frac{3a_0 - 23a_1 k^2}{6a_0^2}$	$\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	0	0
$\Delta_{0}^{\#3}$	$-\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$\frac{5a_0 + 23a_1 k^2}{4a_0^2}$	$-\frac{9a_0+23a_1k^2}{12a_0^2}$	$-\frac{3a_0 + 23a_1 k^2}{6 \sqrt{2} a_0^2}$	$\frac{20ia_1k}{\sqrt{3}a_0^2}$	0	0
$\Delta_0^{\#2}$	$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{3(a_0+23a_1k^2)}{4a_0^2}$	$\frac{5a_0 + 23a_1k^2}{4a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$\frac{20i\sqrt{3}a_1k}{a_0^2}$	0	0
$\Delta_0^{\#1}$	$-\frac{2(a_0+25a_1k^2)}{a_0^2}$	$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$\frac{50 i \sqrt{2} a_1 k}{a_0^2}$	0	0
,	$\Delta_{0}^{\#1}$ \mp	Δ ^{#2} ₀ +	Δ#3+ 0++	Δ ₀ ^{#4} †	~#1 0+	~#2 0+	$\Delta_{0}^{\#1}$ \dagger

Massive and	d mass	less s	pect
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** MassiveAnalysisOfSector...Null

Unitarity conditions