

Particle spectrograph

Wave operator and propagator

Quadratic (free) action

$$\begin{aligned} S = & \iiint \iiint (\frac{1}{8} \, h^{\alpha \beta} \, \mathcal{T}_{\alpha \beta} - 4 \, \Gamma^{\alpha \beta \chi} \, (a_0 \, \Gamma_{\beta \chi \alpha} - 2 \, \Delta_{\alpha \beta \chi} + a_0 \, \partial_{\beta} h_{\alpha \chi}) + 2 \, a_0 \, \Gamma^{\alpha \beta} \, _{\alpha} \partial_{\beta} h^{\chi} \, _{\chi} - \\ & 2 \, a_0 \, h^{\chi} \, _{\chi} \partial_{\beta} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} + 2 \, a_0 \, h^{\chi} \, _{\chi} \partial_{\beta} \Gamma^{\alpha \beta} \, _{\alpha} - 4 \, a_0 \, h_{\alpha \chi} \partial_{\beta} \Gamma^{\alpha \beta \chi} + 44 \, a_1 \partial^{\alpha} \Gamma^{\chi \delta} \, _{\delta} \partial_{\beta} \Gamma^{\beta} \, _{\chi \alpha} + \\ & 4 \, a_1 \partial^{\alpha} \Gamma^{\beta} \, _{\chi \alpha} \partial_{\beta} \Gamma^{\chi \delta} \, _{\delta} - 152 \, a_1 \partial^{\alpha} \Gamma^{\chi \delta} \, _{\chi} \partial_{\beta} \Gamma^{\beta} \, _{\delta \alpha} + 2 \, a_0 \, h^{\alpha \beta} \partial_{\beta} \partial_{\alpha} h^{\chi} \, _{\chi} - \\ & a_0 \partial_{\beta} h^{\chi} \, _{\chi} \partial^{\beta} h^{\alpha} \, _{\alpha} + 2 \, a_0 \partial^{\beta} h^{\alpha} \, _{\alpha} \partial_{\chi} h^{\beta} \, _{\chi} + 2 \, a_0 \, \Gamma^{\alpha} \, ^{\beta} \, _{\alpha} (2 \, \Gamma^{\chi} \, _{\beta \chi} - \partial_{\beta} h^{\chi} \, _{\chi} + 2 \, \partial_{\chi} h^{\beta} \, _{\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^{\chi} \, _{\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} + 4 \, a_0 \, h_{\beta \chi} \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} - 4 \, a_1 \partial_{\beta} \Gamma^{\chi} \, _{\delta} \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} - 4 \, a_1 \partial_{\beta} \Gamma^{\delta} \, _{\delta \chi} \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} + \\ & 4 \, a_1 \partial_{\chi} \Gamma^{\delta} \, _{\beta} \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} - 4 \, a_1 \partial_{\chi} \Gamma^{\delta} \, _{\beta \delta} \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} - 4 \, a_1 \partial_{\chi} \Gamma^{\delta} \, _{\delta \beta} \partial^{\chi} \Gamma^{\alpha} \, _{\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} \, _{\chi} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} + 76 \, a_1 \partial_{\beta} \Gamma^{\delta} \, _{\chi \delta} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} + \\ & 44 \, a_1 \partial_{\chi} \Gamma^{\delta} \, _{\beta} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} - 4 \, a_1 \partial_{\chi} \Gamma^{\delta} \, _{\beta \delta} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} - 74 \, a_1 \partial_{\chi} \partial_{\beta} h^{\delta} \, _{\delta} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} + \\ & 8 \, a_1 \partial_{\alpha} \Gamma^{\delta} \, _{\chi} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\beta} - 8 \, a_1 \partial_{\chi} \Gamma^{\alpha} \, _{\delta} \partial^{\chi} \Gamma^{\alpha \beta} \, _{\beta} - 36 \, a_1 \partial_{\chi} \partial_{\beta} h^{\delta} \, _{\delta} \partial^{\chi} \partial_{\alpha} h^{\alpha \beta} + \\ & 17 \, a_1 \partial_{\chi} \partial_{\beta} h^{\delta} \, _{\delta} \partial^{\chi} \partial^{\beta} h^{\alpha} \, _{\alpha} - 4 \, a_1 \partial_{\chi} \Gamma^{\alpha \beta \chi} \partial_{\delta} \Gamma^{\delta} \, _{\alpha \beta} - 4 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \Gamma^{\delta} \, _{\alpha \chi} - \\ & 4 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \Gamma^{\delta} \, _{\alpha} \, _{\chi} + 76 \, a_1 \partial_{\chi} \Gamma^{\alpha \beta \chi} \partial_{\delta} \Gamma^{\delta} \, _{\beta \alpha} + 8 \, a_1 \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\beta} \Gamma^{\delta} \, _{\delta} \, _{\chi} - \\ & 44 \, a_1 \partial^{\chi} \Gamma^{\alpha \beta} \, _{\beta} \partial_{\delta} \Gamma^{\chi \alpha} \, _{\alpha} + 4 \, a_1 \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} \partial_{\delta} \Gamma^{\chi \beta} \, _{\beta} - 4 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \Gamma^{\delta} \, _{\chi} \, _{\alpha} - \\ & 4 \, a_1 \partial^{\chi} \Gamma^{\alpha \beta} \, _{\beta} \partial_{\delta} \Gamma^{\chi} \, _{\alpha} \, ^{\delta} + 4 \, a_1 \partial^{\chi} \Gamma^{\beta} \, _{\alpha} \, ^{\delta} \partial_{\delta} \Gamma^{\chi} \, _{\chi} \, ^{\delta \alpha} + 8 \, a_1 \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \Gamma^{\delta} \, _{\chi} \, _{\beta} - \\ & 4 \, a_1 \partial_{\beta} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \Gamma^{\chi} \, _{\chi} \, ^{\delta} + 8 \, a_1 \partial_{\beta} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \Gamma^{\chi \delta} \, _{\chi} - 4 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta} \, _{\alpha} \partial_{\delta} \Gamma^{\chi \delta} \, _{\chi} - \\ & 74 \, a_1 \partial_{\chi} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial_{\alpha} h^{\delta} \, _{\delta} - 6 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial_{\alpha} h^{\delta} \, _{\chi} - 74 \, a_1 \partial_{\chi} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\alpha} + \\ & 3 \, a_1 \partial_{\chi} h^{\alpha \beta} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\alpha} + 37 \, a_1 \partial_{\alpha} \partial_{\chi} h^{\alpha \beta} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} + 6 \, a_1 \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} + \\ & 74 \, a_1 \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} - 3 \, a_1 \partial^{\chi} \partial_{\alpha} h^{\alpha \beta} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} + 26 \, a_1 \partial^{\chi} \partial^{\beta} h^{\alpha} \, _{\alpha} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} - \\ & 6 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial_{\chi} h^{\delta} \, _{\alpha} - 43 \, a_1 \partial_{\alpha} \partial^{\chi} h^{\alpha \beta} \partial_{\delta} \partial_{\chi} h^{\delta} \, _{\beta} + 6 \, a_1 \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \partial_{\beta} h^{\delta} \, _{\chi} + \\ & 74 \, a_1 \partial^{\chi} \Gamma^{\alpha \beta} \, _{\alpha} \partial_{\delta} \partial_{\chi} h^{\delta} \, _{\beta} + 77 \, a_1 \partial^{\chi} \partial_{\alpha} h^{\alpha \beta} \partial_{\delta} \partial_{\chi} h^{\delta} \, _{\beta} - 58 \, a_1 \partial^{\chi} \partial^{\beta} h^{\alpha} \, _{\alpha} \partial_{\delta} \partial_{\chi} h^{\delta} \, _{\beta} + \\ & 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} + 74 \, a_1 \partial_{\chi} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial^{\delta} h_{\alpha \beta} + 17 \, a_1 \partial_{\chi} \partial^{\chi} h^{\alpha \beta} \partial_{\delta} \partial^{\delta} h_{\alpha \beta} + \\ & 6 \, a_1 \partial_{\beta} \Gamma^{\alpha \beta \chi} \partial_{\delta} \partial^{\delta} h_{\alpha \chi} + 2 \, a_1 \partial_{\alpha} \partial^{\chi} h^{\alpha \beta} \partial_{\delta} \partial^{\delta} h_{\beta \chi} - 6 \, a_1 \partial^{\chi} \Gamma^{\alpha} \, _{\alpha} \, ^{\beta} \partial_{\delta} \partial^{\delta} h_{\beta \chi} - \\ & 74 \, a_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 \chi} \, _{\delta} \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} + \\ & 4 \, a_1 \partial_{\beta} \Gamma^{\delta \alpha} \, ^{\beta} \partial^{\delta} \Gamma^{\chi \alpha} \, _{\chi} + 4 \, a_1 \partial_{\beta} \Gamma^{\delta \alpha} \, ^{\beta} \partial^{\delta} \Gamma^{\chi} \, _{\alpha} \, ^{\alpha} - 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] d z \, d y \, d x \, d t \end{aligned}$$

$$\Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1}$$

$$\Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1} + ^{\alpha \beta \chi} \Delta_{3^{-}}^{\#1}$$

$\Gamma_{1^{-}}^{\#1} + ^{\alpha \beta}$	$\Gamma_{1^{-}}^{\#2} + ^{\alpha \beta}$	$\Gamma_{1^{-}}^{\#3} + ^{\alpha}$	$\Gamma_{1^{-}}^{\#4} + ^{\alpha}$	$\Gamma_{1^{-}}^{\#5} + ^{\alpha}$	$\Gamma_{1^{-}}^{\#6} + ^{\alpha}$	$h_{1^{-}}^{\#1} + ^{\alpha}$
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
$\frac{1}{4}(-a_0-3a_1k^2)$	$\frac{a_0}{2\sqrt{2}}$	0	0	$5\sqrt{\frac{3}{2}}a_1k^2$	$-\frac{5a_1k^2}{\sqrt{3}}$	0
0	0	0	0	0	0	0
0	0	0	0	$-\frac{a_0}{3}$	$\frac{1}{6}(-a_0+20a_1k^2)$	0
0	0	0	0	$-\frac{5}{6}\sqrt{\frac{5}{2}}a_1k^2$	$-\frac{1}{6}\sqrt{5}(a_0+16a_1k^2)$	0
0	0	0	0	$-\frac{a_0}{6\sqrt{2}}$	$\frac{a_0}{3}$	0
0	0	0	0	$-\frac{1}{6}\sqrt{\frac{5}{2}}(a_0+16a_1k^2)$	$\frac{a_0+40a_1k^2}{6\sqrt{2}}$	0
0	0	0	0	$-\frac{5a_1k^2}{\sqrt{3}}$	$\frac{5}{12}(a_0-17a_1k^2)$	0
0	0	0	0	0	0	0

$\Delta_{2^{+}}^{\#1} + ^{\alpha \beta}$	$\Delta_{2^{+}}^{\#2} + ^{\alpha \beta}$	$\Delta_{2^{+}}^{\#3} + ^{\alpha \beta}$	$\mathcal{T}_{2^{+}}^{\#1} + ^{\alpha \beta}$	$\Delta_{2^{+}}^{\#1} + ^{\alpha \beta \chi}$	$\Delta_{2^{+}}^{\#2} + ^{\alpha \beta \chi}$
$\frac{4(a_0-11a_1k^2)}{a_0^2}$	$\frac{40\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{80a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{44i\sqrt{2}a_1k}{a_0^2}$	0	0
$\frac{40\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{2(3a_0+5a_1k^2)}{3a_0^2}$	$-\frac{2\sqrt{2}a_1k^2}{3a_0^2}$	$-\frac{80ia_1k}{\sqrt{3}a_0^2}$	0	0
$-\frac{80a_1k^2}{\sqrt{3}a_0^2}$	$\frac{2\sqrt{2}a_1k^2}{3a_0^2}$	$\frac{4(3a_0+5a_1k^2)}{3a_0^2}$	$-\frac{80i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	0	0
$\frac{44i\sqrt{2}a_1k}{a_0^2}$	$\frac{80ia_1k}{\sqrt{3}a_0^2}$	$-\frac{8(5a_0+11a_1k^2)}{a_0^2k^2}$	$-\frac{8(a_0+11a_1k^2)}{a_0^2k^2}$	0	0
0	0	0	0	$\frac{4}{a_0a_1k^2}$	$\frac{4}{a_0-5a_1k^2}$
0	0	0	0	0	0

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

$\Delta_{0^{+}}^{\#1} + ^{\alpha}$	$\Delta_{0^{+}}^{\#2} + ^{\alpha}$	$\Delta_{0^{+}}^{\#3} + ^{\alpha}$	$\Delta_{0^{+}}^{\#4} + ^{\alpha}$	$\mathcal{T}_{0^{+}}^{\#1} + ^{\alpha}$	$\mathcal{T}_{0^{+}}^{\#2} + ^{\alpha}$	$\Delta_{0^{+}}^{\#1} + ^{\alpha}$
$-\frac{2(a_0+25a_1k^2)}{a_0^2}$	$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{50i\sqrt{2}a_1k}{a_0^2}$	0	0
$\frac{10\sqrt{6}a_1k^2}{a_0^2}$	$-\frac{3(a_0+23a_1k^2)}{4a_0^2}$	$\frac{5a_0+23a_1k^2}{4a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$\frac{20i\sqrt{3}a_1k}{a_0^2}$	0	0
$\frac{10\sqrt{\frac{2}{3}}a_1k^2}{a_0^2}$	$\frac{5a_0+23a_1k^2}{4a_0^2}$	$-\frac{9a_0+23a_1k^2}{12a_0^2}$	$-\frac{3a_0+23a_1k^2}{6\sqrt{2}a_0^2}$	$-\frac{20ia_1k}{\sqrt{3}a_0^2}$	0	0
$-\frac{20a_1k^2}{\sqrt{3}a_0^2}$	$-\frac{a_0-23a_1k^2}{2\sqrt{2}a_0^2}$	$-\frac{3a_0+23a_1k^2}{6\sqrt{2}a_0^2}$	$\frac{3a_0-23a_1k^2}{6a_0^2}$	$-\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	0	0
$\frac{50i\sqrt{2}a_1k}{a_0^2}$	$-\frac{20i\sqrt{3}a_1k}{a_0^2}$	$\frac{20ia_1k}{\sqrt{3}a_0^2}$	$\frac{20i\sqrt{\frac{2}{3}}a_1k}{a_0^2}$	$\frac{4(a_0-25a_1k^2)}{a_0^2k^2}$	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	$-\frac{2}{a_0a_1k^2}$

$\Gamma_{0^{+}}^{\#1} + ^{\alpha}$	$\Gamma_{0^{+}}^{\#2} + ^{\alpha}$	$\Gamma_{0^{+}}^{\#3} + ^{\alpha}$	$\Gamma_{0^{+}}^{\#4} + ^{\alpha}$	$h_{0^{+}}^{\#1} + ^{\alpha}$	$h_{0^{+}}^{\#2} + ^{\alpha}$	$\Gamma_{0^{+}}^{\#1} + ^{\alpha}$
$\frac{1}{2}(-a_0+25a_1k^2)$	0	$10\sqrt{\frac{2}{3}}a_1k^2$	$-\frac{10a_1k^2}{\sqrt{3}}$	$-\frac{25ia_1k^3}{2\sqrt{2}}$	0	0
0	0	$\frac{a_0}{2}$	$-\frac{a_0}{2\sqrt{2}}$	0	0	0
$10\sqrt{\frac{2}{3}}a_1k^2$	$\frac{a_0}{2}$	$\frac{23a_1k^2}{3}$	$-\frac{3a_0+46a_1k^2}{6\sqrt{2}}$	$-\frac{10ia_1k^3}{\sqrt{3}}$	0	0
$-\frac{10a_1k^2}{\sqrt{3}}$	$-\frac{a_0}{2\sqrt{2}}$	$-\frac{3a_0+46a_1k^2}{6\sqrt{2}}$	$\frac{1}{6}(3a_0+23a_1k^2)$	$5i\sqrt{\frac{2}{3}}a_1k^3$	0	0
$\frac{25ia_1k^3}{2\sqrt{2}}$	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
0	0	0	0	0	0	0
0	0	0	0	0	0	$\frac{1}{2}(-a_0+a_1k^2)$

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

Massive and massless spectra

** MassiveAnalysisOfSector... Null

Unitarity conditions

