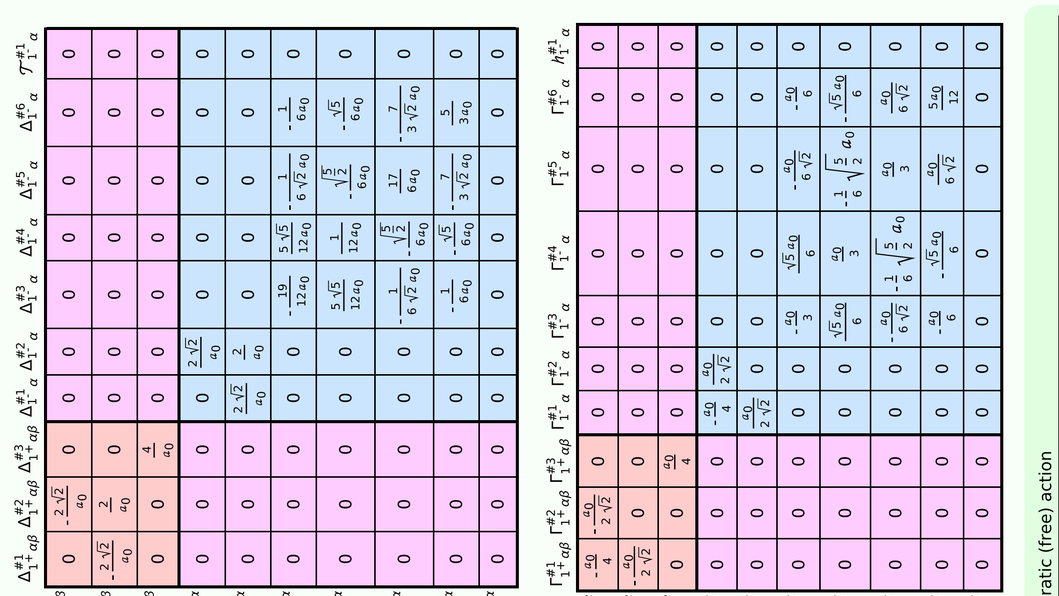
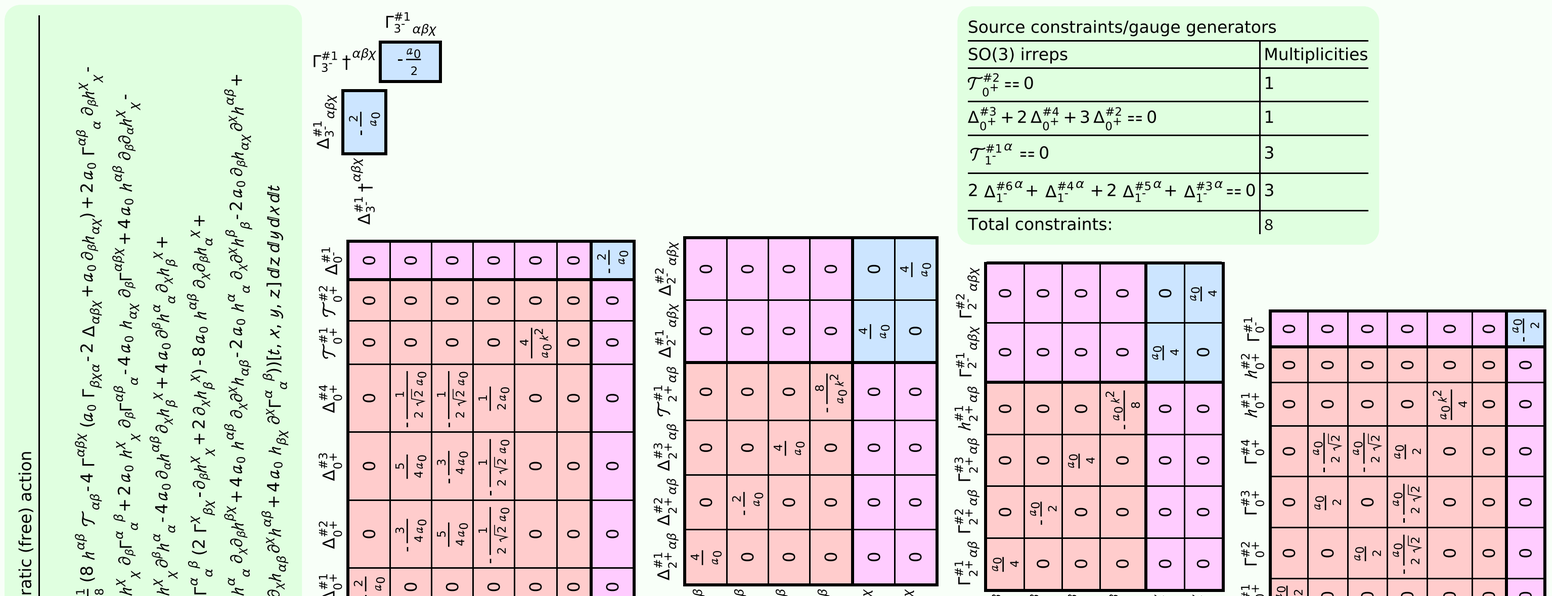
Particle spectrograph

Wave operator and propagator





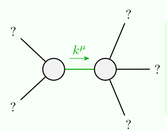
Quadratic (free) action

$$S_F == \int\int\int\int \frac{1}{8}\,(8\,h^{\alpha\beta}\,\mathcal{T}_{\alpha\beta} - 4\,\Gamma^{\alpha\beta\chi}\,(a_0\,\Gamma_{\beta\chi} - 2\,\Delta_{\alpha\beta\chi} + a_0\,\partial_\beta h^{\alpha}{}_{\chi}) + 2\,a_0\,\Gamma^{\alpha\beta}{}_{\alpha}\,\partial_\beta h^{\chi}{}_{\chi} - 2\,a_0\,h^{\chi}{}_{\chi}\,\partial_\beta \Gamma^{\alpha\beta}{}_{\alpha} + 2\,a_0\,h^{\chi}{}_{\beta}\,\partial_\chi \Gamma^{\alpha\beta}{}_{\alpha} - 4\,a_0\,h_{\alpha\chi}\,\partial_\beta \Gamma^{\alpha\beta\chi} + 4\,a_0\,h^{\alpha\beta}\,\partial_\beta \partial_\alpha h^{\chi}{}_{\chi} - a_0\,\partial_\beta h^{\chi}{}_{\chi}\,\partial^\beta h^{\alpha}{}_{\alpha} - 4\,a_0\,\partial_\alpha h^{\alpha\beta}\,\partial_\chi h^{\chi}{}_{\beta} + 4\,a_0\,\partial^\beta h^{\alpha}{}_{\alpha}\,\partial_\chi h^{\chi}{}_{\beta} + 2\,a_0\,\Gamma^{\alpha}{}_{\alpha}{}^{\beta}\,(2\,\Gamma^{\chi}{}_{\beta\chi} - \partial_\beta h^{\chi}{}_{\chi} + 2\,\partial_\chi h_{\beta}{}^{\chi}) - 8\,a_0\,h^{\alpha\beta}\,\partial_\chi \partial_\beta h_{\alpha}{}^{\chi} + 2\,a_0\,h^{\alpha}{}_{\alpha}\,\partial_\chi \partial_\beta h^{\beta\chi} + 4\,a_0\,h^{\alpha\beta}\,\partial_\chi \partial^\chi h_{\alpha\beta} - 2\,a_0\,h^{\alpha}{}_{\alpha}\,\partial_\chi \partial^\chi h^{\beta}{}_{\beta} - 2\,a_0\,\partial_\beta h_{\alpha\chi}\,\partial^\chi h^{\alpha\beta} + 3\,a_0\,\partial_\chi h_{\alpha\beta}\,\partial^\chi h^{\alpha\beta} + 4\,a_0\,h_{\beta\chi}\,\partial^\chi \Gamma^{\alpha}{}_{\alpha}{}^{\beta})]\,[t,\,x,\,y,\,z]\,dz\,dy\,dx\,dt$$

Source constraints/gauge generators

SO(3) irreps	Multiplicities
$\mathcal{T}_{0^+}^{\#2} == 0$	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

Massive and massless spectra



Quadratic pole	
Pole residue:	$-\frac{1}{a_0} > 0$
Polarisations:	2

(No massive particles)

Unitarity conditions

$a_0 < 0$