

PSALTer results panel

$$S == \iiint \big( h^{\alpha\beta} \mathcal{T}_{\alpha\beta} - \alpha_2 \cdot \partial^\beta h^\alpha_\alpha \partial_\chi h^\chi_\beta + \frac{1}{2} \alpha_1 \cdot (\partial_\beta h^\chi_\chi \partial^\beta h^\alpha_\alpha + 2 \partial_\alpha h^{\alpha\beta} \partial_\chi h^\chi_\beta - \partial_\chi h_{\alpha\beta} \partial^\chi h^{\alpha\beta}) \big) [t, \chi, y, z] dz dy d\chi dt$$

Wave operator

$0^+ h^\perp$

$0^+ h^\parallel$

$0^+ h^\perp \dagger$

$0^+ h^\parallel \dagger$

$(\alpha_1 - \alpha_2) k^2$

$\frac{1}{2} \sqrt{3} (\alpha_1 - \alpha_2) k^2$

$\frac{1}{2} \sqrt{3} (\alpha_1 - \alpha_2) k^2$

$\alpha_1 k^2$

$1^- h^\perp_\alpha$

$1^- h^\perp \dagger^\alpha$

$0$

$2^+ h^\parallel_{\alpha\beta}$

$2^+ h^\parallel \dagger^{\alpha\beta}$

$\frac{\alpha_1 k^2}{-\frac{1}{2}}$

Saturated propagator

$0^+ \mathcal{T}^\perp$

$0^+ \mathcal{T}^\parallel$

$0^+ \mathcal{T}^\perp \dagger$

$0^+ \mathcal{T}^\parallel \dagger$

$\frac{4 \alpha_1}{(\alpha_1 - \alpha_2) (\alpha_1 + 3 \alpha_2) k^2}$

$-\frac{2 \sqrt{3}}{(\alpha_1 + 3 \alpha_2) k^2}$

$-\frac{2 \sqrt{3}}{(\alpha_1 + 3 \alpha_2) k^2}$

$\frac{4}{(\alpha_1 + 3 \alpha_2) k^2}$

$1^- \mathcal{T}^\perp_\alpha$

$1^- \mathcal{T}^\perp \dagger^\alpha$

$0$

$2^+ \mathcal{T}^\parallel_{\alpha\beta}$

$2^+ \mathcal{T}^\parallel \dagger^{\alpha\beta}$

$-\frac{2}{\alpha_1 k^2}$

Source constraints

Spin-parity form	Covariant form	Multiplicities
$1^- \mathcal{T}^\perp{}^\alpha == 0$	$\partial_\chi \partial_\beta \partial^\alpha \mathcal{T}^{\beta\chi} == \partial_\chi \partial^\chi \partial_\beta \mathcal{T}^{\alpha\beta}$	3
Total expected gauge generators:		3

Massive spectrum

(No particles)

Massless spectrum

Massless particle

Pole residue:	$-\frac{p^2}{\alpha_1} > 0$
Polarisations:	2

Massless particle

Pole residue:	$\frac{(\alpha_1^2 - 2 \alpha_1 \alpha_2 + 5 \alpha_2^2) p^2}{\alpha_1 (\alpha_1 - \alpha_2) (\alpha_1 + 3 \alpha_2)} > 0$
Polarisations:	1

Unitarity conditions

$$\alpha_1 < 0 \ \& \ (\alpha_2 < \alpha_1 \ || \ \alpha_2 > -\frac{\alpha_1}{3})$$