PSALTer results panel

$$\mathcal{S} == \iiiint \Big(\frac{1}{6}\,(2\,(t_1 - 2\,t_3)\,\mathcal{A}^{\alpha\imath}{}_{\alpha}\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta} + 6\,\mathcal{A}^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + 6\,f^{\alpha\beta}\,\tau(\Delta+\mathcal{K})_{\alpha\beta} - 4\,t_1\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_\imath f^{\alpha\imath} + 8\,t_3\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_\imath f^{\alpha\imath} + 4\,t_1\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} - 8\,t_3\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} - 2\,t_1\,\partial_\imath f^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} + 4\,t_3\,\partial_\imath f^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} - 2\,t_1\,\partial_\imath f^{\alpha\imath}\,\partial_\theta f_{\alpha}{}^{\theta} + 4\,t_3\,\partial_\imath f^{\alpha\imath}\,\partial_\theta f_{\alpha}{}^{\theta} + 4\,t_1\,\partial^\imath f^{\alpha}{}_{\alpha}\,\partial_\theta f_{\imath}{}^{\theta} - 8\,t_3\,\partial^\imath f^{\alpha}{}_{\alpha}\,\partial_\theta f_{\imath}{}^{\theta} + 8\,r_2\,\partial_\beta \mathcal{A}_{\alpha\imath\theta}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} - 4\,r_2\,\partial_\beta \mathcal{A}_{\alpha\theta\imath}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} + 4\,r_2\,\partial_\beta \mathcal{A}_{\imath\theta\alpha}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} - 2\,r_2\,\partial_\imath \mathcal{A}_{\alpha\beta\theta}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} + 2\,r_2\,\partial_\theta \mathcal{A}_{\alpha\beta\imath}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} - 4\,r_2\,\partial_\theta \mathcal{A}_{\alpha\imath\beta}\,\partial^\theta \mathcal{A}^{\alpha\beta\imath} - 6\,t_1\,\partial_\alpha f_{\imath\theta}\,\partial^\theta f^{\alpha\imath} - 3\,t_1\,\partial_\alpha f_{\theta\imath}\,\partial^\theta f^{\alpha\imath} + 3\,t_1\,\partial_\imath f_{\alpha\theta}\,\partial^\theta f^{\alpha\imath} + 3\,t_1\,\partial_\theta f_{\alpha\imath}\,\partial^\theta f^{\alpha\imath} + 3\,t_1\,\partial_\theta f_{\imath\alpha}\,\partial^\theta f^{\alpha\imath} + 6\,t_1\,\mathcal{A}_{\alpha\theta\imath}\,(\mathcal{A}^{\alpha\imath\theta} + 2\,\partial^\theta f^{\alpha\imath})\Big)[t, x, y, z]\,dz\,dy\,dx\,dt$$

Wave operator

	$0^+_.\mathcal{A}^{\parallel}$	$0^+_.f^{\parallel}$	$0^+_.f^{\perp}$	$0^-_.\mathcal{A}^{\parallel}$
$0^+_.\mathcal{A}^{\parallel}\dagger$	t_3	$-i\sqrt{2}\,k\,t_3$	0	0
$0^+_.f^{\parallel}\dagger$	$i\sqrt{2}\,k\,t_3$	$2k^2\,t_3$	0	0
$0^+_.f^{\perp}\dagger$	0	0	0	0
$0^-_.\mathcal{A}^{\parallel}\dagger$	0	0	0	$k^2\,r_2 - t_1$

	$1^+_.\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$1^+_.\mathcal{A}^{\perp}{}_{\alpha\beta}$	$1^+_.f^{\parallel}{}_{\alpha\beta}$	$1^-_.\mathcal{A}^{\parallel}{}_{\alpha}$	$1^-_.\mathcal{A}^{\perp}{}_{\alpha}$	$1^-_.f^{\parallel}{}_{\alpha}$	$1^-_.f^{\perp}{}_{\alpha}$
$1^+_.\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	$-\frac{t_1}{2}$	$-\frac{t_1}{\sqrt{2}}$	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0
$1^+_.\mathcal{A}^{\perp}\dagger^{\alpha\beta}$	$-\frac{t_1}{\sqrt{2}}$	0	0	0	0	0	0
$1^+_.f^{\parallel}\dagger^{\alpha\beta}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	0	0	0	0	0	0
$1^-_.\mathcal{A}^{\parallel}\dagger^{\alpha}$	0	0	0	$\frac{1}{6}\,(t_1 + 4\,t_3)$	$\frac{t_1 - 2\,t_3}{3\sqrt{2}}$	0	$\frac{1}{3}\,i\,k\,(t_1 - 2\,t_3)$
$1^-_.\mathcal{A}^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{t_1 - 2\,t_3}{3\sqrt{2}}$	$\frac{t_1 + t_3}{3}$	0	$\frac{1}{3}\,i\sqrt{2}\,k\,(t_1 + t_3)$
$1^-_.f^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_.f^{\perp}\dagger^{\alpha}$	0	0	0	$-\frac{1}{3}\,i\,k\,(t_1 - 2\,t_3)$	$-\frac{1}{3}\,i\sqrt{2}\,k\,(t_1 + t_3)$	0	$\frac{2}{3}\,k^2\,(t_1 + t_3)$

	$2^+_.\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$2^+_.f^{\parallel}{}_{\alpha\beta}$	$2^-_.\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$2^+_.\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	$\frac{t_1}{2}$	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0
$2^+_.f^{\parallel}\dagger^{\alpha\beta}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	$k^2\,t_1$	0
$2^-_.\mathcal{A}^{\parallel}\dagger^{\alpha\beta\chi}$	0	0	$\frac{t_1}{2}$

Saturated propagator

	$0^+_.\sigma^{\parallel}$	$0^+_.\tau^{\parallel}$	$0^+_.\tau^{\perp}$	$0^-_.\sigma^{\parallel}$
$0^+_.\sigma^{\parallel}\dagger$	$\frac{1}{(1+2\,k^2)^2\,t_3}$	$-\frac{i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_3}$	0	0
$0^+_.\tau^{\parallel}\dagger$	$\frac{i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_3}$	$\frac{2\,k^2}{(1+2\,k^2)^2\,t_3}$	0	0
$0^+_.\tau^{\perp}\dagger$	0	0	0	0
$0^-_.\sigma^{\parallel}\dagger$	0	0	0	$\frac{1}{k^2\,r_2 - t_1}$

	$1^+_.\sigma^{\parallel}{}_{\alpha\beta}$	$1^+_.\sigma^{\perp}{}_{\alpha\beta}$	$1^+_.\tau^{\parallel}{}_{\alpha\beta}$	$1^-_.\sigma^{\parallel}{}_{\alpha}$	$1^-_.\sigma^{\perp}{}_{\alpha}$	$1^-_.\tau^{\parallel}{}_{\alpha}$	$1^-_.\tau^{\perp}{}_{\alpha}$
$1^+_.\sigma^{\parallel}\dagger^{\alpha\beta}$	0	$-\frac{\sqrt{2}}{t_1 + k^2\,t_1}$	$-\frac{i\sqrt{2}\,k}{t_1 + k^2\,t_1}$	0	0	0	0
$1^+_.\sigma^{\perp}\dagger^{\alpha\beta}$	$-\frac{\sqrt{2}}{t_1 + k^2\,t_1}$	$\frac{1}{(1+k^2)^2\,t_1}$	$\frac{i\,k}{(1+k^2)^2\,t_1}$	0	0	0	0
$1^+_.\tau^{\parallel}\dagger^{\alpha\beta}$	$\frac{i\sqrt{2}\,k}{t_1 + k^2\,t_1}$	$-\frac{i\,k}{(1+k^2)^2\,t_1}$	$\frac{k^2}{(1+k^2)^2\,t_1}$	0	0	0	0
$1^-_.\sigma^{\parallel}\dagger^{\alpha}$	0	0	0	$\frac{2\,(t_1 + t_3)}{3\,t_1\,t_3}$	$-\frac{\sqrt{2}\,(t_1 - 2\,t_3)}{3\,(1+2\,k^2)\,t_1\,t_3}$	0	$-\frac{2\,i\,k\,t_1 - 4\,i\,k\,t_3}{3\,t_1\,t_3 + 6\,k^2\,t_1\,t_3}$
$1^-_.\sigma^{\perp}\dagger^{\alpha}$	0	0	0	$-\frac{\sqrt{2}\,(t_1 - 2\,t_3)}{3\,(1+2\,k^2)\,t_1\,t_3}$	$\frac{t_1 + 4\,t_3}{3\,(1+2\,k^2)^2\,t_1\,t_3}$	0	$\frac{i\sqrt{2}\,k\,(t_1 + 4\,t_3)}{3\,(1+2\,k^2)^2\,t_1\,t_3}$
$1^-_.\tau^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_.\tau^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{2\,i\,k\,t_1 - 4\,i\,k\,t_3}{3\,t_1\,t_3 + 6\,k^2\,t_1\,t_3}$	$-\frac{i\sqrt{2}\,k\,(t_1 + 4\,t_3)}{3\,(1+2\,k^2)^2\,t_1\,t_3}$	0	$\frac{2\,k^2\,(t_1 + 4\,t_3)}{3\,(1+2\,k^2)^2\,t_1\,t_3}$

	$2^+_.\sigma^{\parallel}{}_{\alpha\beta}$	$2^+_.\tau^{\parallel}{}_{\alpha\beta}$	$2^-_.\sigma^{\parallel}{}_{\alpha\beta\chi}$
$2^+_.\sigma^{\parallel}\dagger^{\alpha\beta}$	$\frac{2}{(1+2\,k^2)^2\,t_1}$	$-\frac{2\,i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	0
$2^+_.\tau^{\parallel}\dagger^{\alpha\beta}$	$\frac{2\,i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	$\frac{4\,k^2}{(1+2\,k^2)^2\,t_1}$	0
$2^-_.\sigma^{\parallel}\dagger^{\alpha\beta\chi}$	0	0	$\frac{2}{t_1}$

Source constraints

Spin-parity form	Covariant form	Multiplicities
$0^+_.\tau^{\perp} == 0$	$\partial_\beta\partial_\alpha\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$-2\,i\,k\,0^+_.\sigma^{\parallel} + 0^+_.\tau^{\parallel} == 0$	$\partial_\beta\partial_\alpha\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == \partial_\beta\partial^\beta\tau\,(\Delta+\mathcal{K})^{\alpha}{}_{\alpha} + 2\,\partial_\chi\partial^\chi\partial_\beta\sigma^{\alpha}{}_{\alpha}{}^{\beta}$	1
$2\,i\,k\,1^-_.\sigma^{\perp\alpha} + 1^-_.\tau^{\perp\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta\tau\,(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_\delta\partial^\delta\partial_\chi\partial_\beta\sigma^{\beta\alpha\chi}$	3
$1^-_.\tau^{\parallel\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta\tau\,(\Delta+\mathcal{K})^{\beta\alpha}$	3
$i\,k\,1^+_.\sigma^{\perp\alpha\beta} + 1^+_.\tau^{\parallel\alpha\beta} == 0$	$\partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} + \partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + \partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_\delta\partial_\chi\partial^\alpha\sigma^{\chi\beta\delta} + 2\,\partial_\delta\partial^\delta\partial_\chi\sigma^{\chi\alpha\beta} == \partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi\beta} + \partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\alpha\chi} + \partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\partial_\delta\partial_\chi\partial^\beta\sigma^{\chi\alpha\delta}$	3
$-2\,i\,k\,2^+_.\sigma^{\parallel\alpha\beta} + 2^+_.\tau^{\parallel\alpha\beta} == 0$	$-i\,(4\,\partial_\delta\partial_\chi\partial^\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi\delta} + 2\,\partial_\delta\partial^\delta\partial^\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi}{}_{\chi} - 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} - 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\alpha\chi} - 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\alpha\beta} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\beta\alpha} + 4\,i\,k^\chi\,\partial_\epsilon\partial_\chi\partial^\beta\partial^\alpha\sigma^{\delta}{}_{\delta}{}^{\epsilon} - 6\,i\,k^\chi\,\partial_\epsilon\partial_\delta\partial_\chi\partial^\alpha\sigma^{\delta\beta\epsilon} - 6\,i\,k^\chi\,\partial_\epsilon\partial_\delta\partial_\chi\partial^\beta\sigma^{\delta\alpha\epsilon} + 6\,i\,k^\chi\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial_\chi\sigma^{\alpha\beta\delta} + 6\,i\,k^\chi\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial_\chi\sigma^{\beta\alpha\delta} + 2\,\eta^{\alpha\beta}\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial_\chi\tau\,(\Delta+\mathcal{K})^{\chi\delta} - 2\,\eta^{\alpha\beta}\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial^\delta\tau\,(\Delta+\mathcal{K})^{\chi}{}_{\chi} - 4\,i\,\eta^{\alpha\beta}\,k^\chi\,\partial_\phi\partial^\phi\partial_\epsilon\partial_\chi\sigma^{\delta}{}_{\delta}{}^{\epsilon}) == 0$	5
Total expected gauge generators:		16

Massive spectrum

Massive particle

Pole residue:	$-\frac{1}{r_2} > 0$
Square mass:	$\frac{t_1}{r_2} > 0$
Spin:	0
Parity:	Odd

Massless spectrum

(No particles)

Unitarity conditions

$r_2 < 0\ \&\&\ t_1 < 0$