PSALTer results panel

$$\mathcal{S} == \int\int\int\int \Big(\frac{1}{6}\,(6\,t_1\,\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} - 12\,t_1\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_\imath f^{\alpha\imath} + 12\,t_1\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} - 6\,t_1\,\partial_\imath f^{\theta}{}_{\theta}\,\partial^\imath f^{\alpha}{}_{\alpha} - 6\,t_1\,\partial_\imath f^{\alpha\imath}\,\partial_\theta f_{\alpha}{}^{\theta} + 12\,t_1\,\partial^\imath f^{\alpha}{}_{\alpha}\,\partial_\theta f_{\imath}{}^{\theta} - 8\,r_1\,\partial_\beta\mathcal{A}_{\alpha\imath\theta}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} + 4\,r_1\,\partial_\beta\mathcal{A}_{\alpha\theta\imath}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} - 16\,r_1\,\partial_\beta\mathcal{A}_{\imath\theta\alpha}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} - 4\,r_1\,\partial_\imath\mathcal{A}_{\alpha\beta\theta}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} + 4\,r_1\,\partial_\theta\mathcal{A}_{\alpha\beta\imath}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} + 4\,r_1\,\partial_\theta\mathcal{A}_{\alpha\imath\beta}\,\partial^\theta\mathcal{A}^{\alpha\beta\imath} + 6\,r_5\,\partial_\imath\mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\,\partial^\theta\mathcal{A}^{\alpha\imath}{}_{\alpha} - 6\,r_5\,\partial_\theta\mathcal{A}_{\imath}{}^{\kappa}{}_{\kappa}\,\partial^\theta\mathcal{A}^{\alpha\imath}{}_{\alpha} + 4\,t_1\,\mathcal{A}_{\imath\theta\alpha}\,\partial^\theta f^{\alpha\imath} - 4\,t_1\,\partial_\alpha f_{\imath\theta}\,\partial^\theta f^{\alpha\imath} + 2\,t_2\,\partial_\alpha f_{\imath\theta}\,\partial^\theta f^{\alpha\imath} - 4\,t_1\,\partial_\alpha f_{\theta\imath}\,\partial^\theta f^{\alpha\imath} - t_2\,\partial_\alpha f_{\theta\imath}\,\partial^\theta f^{\alpha\imath} + 2\,t_1\,\partial_\imath f_{\alpha\theta}\,\partial^\theta f^{\alpha\imath} - t_2\,\partial_\imath f_{\alpha\theta}\,\partial^\theta f^{\alpha\imath} + 4\,t_1\,\partial_\theta f_{\alpha\imath}\,\partial^\theta f^{\alpha\imath} + t_2\,\partial_\theta f_{\alpha\imath}\,\partial^\theta f^{\alpha\imath} + 2\,t_1\,\partial_\theta f_{\imath\alpha}\,\partial^\theta f^{\alpha\imath} - t_2\,\partial_\theta f_{\imath\alpha}\,\partial^\theta f^{\alpha\imath} + 2\,(t_1+t_2)\,\mathcal{A}_{\alpha\imath\theta}\,(\mathcal{A}^{\alpha\imath\theta} + 2\,\partial^\theta f^{\alpha\imath}) + 2\,\mathcal{A}_{\alpha\theta\imath}\,((t_1-2\,t_2)\,\mathcal{A}^{\alpha\imath\theta} + 2\,(2\,t_1-t_2)\,\partial^\theta f^{\alpha\imath}) - 6\,r_5\,\partial_\alpha\mathcal{A}^{\alpha\imath\theta}\,\partial_\kappa\mathcal{A}_{\imath}{}^{\kappa}{}_{\theta} + 12\,r_5\,\partial^\theta\mathcal{A}^{\alpha\imath}{}_{\alpha}\,\partial_\kappa\mathcal{A}_{\imath}{}^{\kappa}{}_{\theta} + 6\,r_5\,\partial_\alpha\mathcal{A}^{\alpha\imath\theta}\,\partial_\kappa\mathcal{A}_{\theta}{}^{\kappa}{}_{\imath}\Big)[t,\,x,\,y,\,z]\,dt\,dz\,dy\,dx\,dt$$

Wave operator

	$0^+_{\cdot}\mathcal{A}^{\parallel}$	$0^+_{\cdot}f^{\parallel}$	$0^+_{\cdot}f^{\perp}$	$0^-_{\cdot}\mathcal{A}^{\parallel}$
$0^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger$	$-t_1$	$i\sqrt{2}\,k\,t_1$	0	0
$0^+_{\cdot}f^{\parallel}\,\dagger$	$-i\sqrt{2}\,k\,t_1$	$-2\,k^2\,t_1$	0	0
$0^+_{\cdot}f^{\perp}\,\dagger$	0	0	0	0
$0^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger$	0	0	0	t_2

	$1^+_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$1^+_{\cdot}\mathcal{A}^{\perp}{}_{\alpha\beta}$	$1^+_{\cdot}f^{\parallel}{}_{\alpha\beta}$	$1^-_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\mathcal{A}^{\perp}{}_{\alpha}$	$1^-_{\cdot}f^{\parallel}{}_{\alpha}$	$1^-_{\cdot}f^{\perp}{}_{\alpha}$
$1^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{1}{6}\,(6\,k^2\,(2\,r_1+r_5)+t_1+4\,t_2)$	$-\frac{t_1-2\,t_2}{3\sqrt{2}}$	$-\frac{i\,k\,(t_1-2\,t_2)}{3\sqrt{2}}$	0	0	0	0
$1^+_{\cdot}\mathcal{A}^{\perp}\,\dagger^{\alpha\beta}$	$-\frac{t_1-2\,t_2}{3\sqrt{2}}$	$\frac{t_1+t_2}{3}$	$\frac{1}{3}\,i\,k\,(t_1+t_2)$	0	0	0	0
$1^+_{\cdot}f^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{i\,k\,(t_1-2\,t_2)}{3\sqrt{2}}$	$-\frac{1}{3}\,i\,k\,(t_1+t_2)$	$\frac{1}{3}\,k^2\,(t_1+t_2)$	0	0	0	0
$1^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha}$	0	0	0	$k^2\,(r_1+r_5)-\frac{t_1}{2}$	$\frac{t_1}{\sqrt{2}}$	0	$i\,k\,t_1$
$1^-_{\cdot}\mathcal{A}^{\perp}\,\dagger^{\alpha}$	0	0	0	$\frac{t_1}{\sqrt{2}}$	0	0	0
$1^-_{\cdot}f^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_{\cdot}f^{\perp}\,\dagger^{\alpha}$	0	0	0	$-i\,k\,t_1$	0	0	0

	$2^+_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$2^+_{\cdot}f^{\parallel}{}_{\alpha\beta}$	$2^-_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$2^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{t_1}{2}$	$-\frac{i\,k\,t_1}{\sqrt{2}}$	0
$2^+_{\cdot}f^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{i\,k\,t_1}{\sqrt{2}}$	$k^2\,t_1$	0
$2^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	$k^2\,r_1+\frac{t_1}{2}$

Saturated propagator

	$0^+_{\cdot}\sigma^{\parallel}$	$0^+_{\cdot}\tau^{\parallel}$	$0^+_{\cdot}\tau^{\perp}$	$0^-_{\cdot}\sigma^{\parallel}$
$0^+_{\cdot}\sigma^{\parallel}\,\dagger$	$-\frac{1}{(1+2\,k^2)^2\,t_1}$	$\frac{i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	0	0
$0^+_{\cdot}\tau^{\parallel}\,\dagger$	$-\frac{i\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	$-\frac{2\,k^2}{(1+2\,k^2)^2\,t_1}$	0	0
$0^+_{\cdot}\tau^{\perp}\,\dagger$	0	0	0	0
$0^-_{\cdot}\sigma^{\parallel}\,\dagger$	0	0	0	$\frac{1}{t_2}$

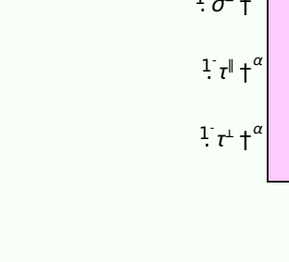
	$1^+_{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$1^+_{\cdot}\sigma^{\perp}{}_{\alpha\beta}$	$1^+_{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$1^-_{\cdot}\sigma^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\sigma^{\perp}{}_{\alpha}$	$1^-_{\cdot}\tau^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\tau^{\perp}{}_{\alpha}$
$1^+_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{2\,(t_1+t_2)}{3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2)}$	$\frac{\sqrt{2}\,(t_1-2\,t_2)}{(1+k^2)\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	$\frac{i\,\sqrt{2}\,k\,(t_1-2\,t_2)}{(1+k^2)\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	0	0	0	0
$1^+_{\cdot}\sigma^{\perp}\,\dagger^{\alpha\beta}$	$\frac{\sqrt{2}\,(t_1-2\,t_2)}{(1+k^2)\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	$\frac{6\,k^2\,(2\,r_1+r_5)+t_1+4\,t_2}{(1+k^2)^2\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	$\frac{i\,k\,(6\,k^2\,(2\,r_1+r_5)+t_1+4\,t_2)}{(1+k^2)^2\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	0	0	0	0
$1^+_{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{i\,\sqrt{2}\,k\,(t_1-2\,t_2)}{(1+k^2)\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	$-\frac{i\,k\,(6\,k^2\,(2\,r_1+r_5)+t_1+4\,t_2)}{(1+k^2)^2\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	$\frac{k^2\,(6\,k^2\,(2\,r_1+r_5)+t_1+4\,t_2)}{(1+k^2)^2\,(3\,t_1\,t_2+2\,k^2\,(2\,r_1+r_5)\,(t_1+t_2))}$	0	0	0	0
$1^-_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	$\frac{\sqrt{2}}{t_1+2\,k^2\,t_1}$	0	$\frac{2\,i\,k}{t_1+2\,k^2\,t_1}$
$1^-_{\cdot}\sigma^{\perp}\,\dagger^{\alpha}$	0	0	0	$\frac{\sqrt{2}}{t_1+2\,k^2\,t_1}$	$\frac{-2\,k^2\,(r_1+r_5)+t_1}{(t_1+2\,k^2\,t_1)^2}$	0	$-\frac{i\,\sqrt{2}\,k\,(2\,k^2\,(r_1+r_5)-t_1)}{(t_1+2\,k^2\,t_1)^2}$
$1^-_{\cdot}\tau^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_{\cdot}\tau^{\perp}\,\dagger^{\alpha}$	0	0	0	$-\frac{2\,i\,k}{t_1+2\,k^2\,t_1}$	$\frac{i\,\sqrt{2}\,k\,(2\,k^2\,(r_1+r_5)-t_1)}{(t_1+2\,k^2\,t_1)^2}$	0	$\frac{-4\,k^4\,(r_1+r_5)+2\,k^2\,t_1}{(t_1+2\,k^2\,t_1)^2}$

	$2^+_{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$2^+_{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$2^-_{\cdot}\sigma^{\parallel}{}_{\alpha\beta\chi}$
$2^+_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{2}{(1+2\,k^2)^2\,t_1}$	$-\frac{2\,i\,\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	0
$2^+_{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{2\,i\,\sqrt{2}\,k}{(1+2\,k^2)^2\,t_1}$	$\frac{4\,k^2}{(1+2\,k^2)^2\,t_1}$	0
$2^-_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	$\frac{2}{2\,k^2\,r_1+t_1}$

Source constraints

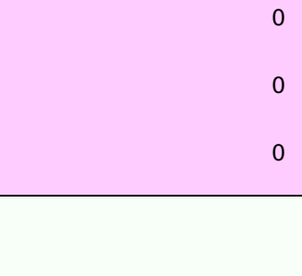
Spin-parity form	Covariant form	Multiplicities
$0^+_{\cdot}\tau^{\perp} == 0$	$\partial_\beta\partial_\alpha\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$-2\,i\,k\,0^+_{\cdot}\sigma^{\parallel} + 0^+_{\cdot}\tau^{\parallel} == 0$	$\partial_\beta\partial_\alpha\tau\,(\Delta+\mathcal{K})^{\alpha\beta}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

Massive spectrum



Massive particle

Pole residue:	$\frac{-3\,t_1\,t_2\,(t_1+t_2)+6\,r_1\,(t_1^2+2\,t_2^2)+3\,r_5\,(t_1^2+2\,t_2^2)}{(2\,r_1+r_5)\,(t_1+t_2)\,(-3\,t_1\,t_2+4\,r_1\,(t_1+t_2)+2\,r_5\,(t_1+t_2))} > 0$
Square mass:	$-\frac{3\,t_1\,t_2}{2\,(2\,r_1+r_5)\,(t_1+t_2)} > 0$
Spin:	1
Parity:	Even



Massive particle

Pole residue:	$-\frac{1}{r_1} > 0$
Square mass:	$-\frac{t_1}{2\,r_1} > 0$
Spin:	2
Parity:	Odd

Massless spectrum

(No particles)

Unitarity conditions

$r_1 < 0 \;\&\&\; t_2 < 0 \;\&\&\; t_1 > -t_2 \;\&\&\; r_5 > -2\,r_1$