PSALTer results panel

$$S == \iiiint\Big(\mathcal{A}^{\alpha\beta\chi}\ \sigma_{\alpha\beta\chi} + f^{\alpha\beta}\ \tau(\Delta+\mathcal{K})_{\alpha\beta} + \frac{1}{3} r_{2}\left(4\,\partial_{\beta}\mathcal{A}_{\alpha\iota\theta} - 2\,\partial_{\beta}\mathcal{A}_{\alpha\theta\iota} + 2\,\partial_{\beta}\mathcal{A}_{\iota\theta\alpha} - \partial_{\iota}\mathcal{A}_{\alpha\beta\theta} + \partial_{\theta}\mathcal{A}_{\alpha\beta\iota} - 2\,\partial_{\theta}\mathcal{A}_{\alpha\iota\beta}\right)\partial^{\theta}\mathcal{A}^{\alpha\beta\iota} -$$
$$2\, r_{3}\left(\partial_{\beta}\mathcal{A}_{\iota}{}^{\theta}{}_{\theta}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_{\iota}\mathcal{A}_{\beta}{}^{\theta}{}_{\theta}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_{\alpha}\mathcal{A}^{\alpha\beta\iota}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\iota} - 2\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\iota} + \partial_{\alpha}\mathcal{A}^{\alpha\beta\iota}\,\partial_{\theta}\mathcal{A}_{\iota}{}^{\theta}{}_{\beta} - 2\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\iota}{}^{\theta}{}_{\beta} + 2\,\partial_{\beta}\mathcal{A}_{\iota\theta\alpha}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}\right) +$$
$$\frac{1}{6} t_{1}\Big(2\,\mathcal{A}^{\alpha\iota}{}_{\alpha}\,\mathcal{A}_{\iota}{}^{\theta}{}_{\theta} - 4\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_{\iota}f^{\alpha\iota} + 4\,\mathcal{A}_{\iota}{}^{\theta}{}_{\theta}\,\partial^{\iota}f^{\alpha}{}_{\alpha} - 2\,\partial_{\iota}f^{\theta}{}_{\theta}\,\partial^{\iota}f^{\alpha}{}_{\alpha} - 2\,\partial_{\iota}f^{\alpha\iota}\,\partial_{\theta}f_{\alpha}{}^{\theta} + 4\,\partial^{\iota}f^{\alpha}{}_{\alpha}\,\partial_{\theta}f_{\iota}{}^{\theta} - 6\,\partial_{\alpha}f_{\iota\theta}\,\partial^{\theta}f^{\alpha\iota} - 3\,\partial_{\alpha}f_{\theta\iota}\,\partial^{\theta}f^{\alpha\iota} + 3\,\partial_{\iota}f_{\alpha\theta}\,\partial^{\theta}f^{\alpha\iota} + 3\,\partial_{\theta}f_{\alpha\iota}\,\partial^{\theta}f^{\alpha\iota} +$$
$$3\,\partial_{\theta}f_{\iota\alpha}\,\partial^{\theta}f^{\alpha\iota} + 6\,\mathcal{A}_{\alpha\theta\iota}\left(\mathcal{A}^{\alpha\iota\theta} + 2\,\partial^{\theta}f^{\alpha\iota}\right)\Big) + r_{5}\left(\partial_{\iota}\mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\,\partial^{\theta}\mathcal{A}^{\alpha\iota}{}_{\alpha} - \partial_{\theta}\mathcal{A}_{\iota}{}^{\kappa}{}_{\kappa}\,\partial^{\theta}\mathcal{A}^{\alpha\iota}{}_{\alpha} - \left(\partial_{\alpha}\mathcal{A}^{\alpha\iota\theta} - 2\,\partial^{\theta}\mathcal{A}^{\alpha\iota}{}_{\alpha}\right)\left(\partial_{\kappa}\mathcal{A}_{\iota}{}^{\kappa}{}_{\theta} - \partial_{\kappa}\mathcal{A}_{\theta}{}^{\kappa}{}_{\iota}\right)\right)\Big)[t,x,y,z]\,dz\,dy\,dx\,dt$$

Wave operator

	${}^{0^+}\mathcal{A}^{\parallel}$	${}^{0^+}f^{\parallel}$	${}^{0^+}f^{\perp}$	${}^{0^-}\mathcal{A}^{\parallel}$
${}^{0^+}\mathcal{A}^{\parallel}\dagger$	$6k^2 r_{3}$	0	0	0
${}^{0^+}f^{\parallel}\dagger$	0	0	0	0
${}^{0^+}f^{\perp}\dagger$	0	0	0	0
${}^{0^-}\mathcal{A}^{\parallel}\dagger$	0	0	0	$k^2 r_{2} - t_{1}$

	${}^{1^+}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	${}^{1^+}\mathcal{A}^{\perp}{}_{\alpha\beta}$	${}^{1^+}f^{\parallel}{}_{\alpha\beta}$	${}^{1^-}\mathcal{A}^{\parallel}{}_{\alpha}$	${}^{1^-}\mathcal{A}^{\perp}{}_{\alpha}$	${}^{1^-}f^{\parallel}{}_{\alpha}$	${}^{1^-}f^{\perp}{}_{\alpha}$
${}^{1^+}\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	$k^2\left(2r_{3}+r_{5}\right)-\frac{t_{1}}{2}$	$-\frac{t_{1}}{\sqrt{2}}$	$-\frac{i k t_{1}}{\sqrt{2}}$	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	$k^2\left(2r_{3}+r_{5}\right)+\frac{t_{1}}{6}$	$\frac{t_{1}}{3\sqrt{2}}$	0	$\frac{i k t_{1}}{3}$
${}^{1^-}\mathcal{A}^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{t_{1}}{3\sqrt{2}}$	$\frac{t_{1}}{3}$	0	$\frac{1}{3} i\sqrt{2}\,k t_{1}$
${}^{1^-}f^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0
${}^{1^-}f^{\perp}\dagger^{\alpha}$	0	0	0	$-\frac{1}{3} i k t_{1}$	$-\frac{1}{3} i\sqrt{2}\,k t_{1}$	0	$\frac{2k^2 t_{1}}{3}$

	${}^{2^+}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	${}^{2^+}f^{\parallel}{}_{\alpha\beta}$	${}^{2^-}\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
${}^{2^+}\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	$\frac{t_{1}}{2}$	$-\frac{i k t_{1}}{\sqrt{2}}$	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

	${}^{0^+}\sigma^{\parallel}$	${}^{0^+}\tau^{\parallel}$	${}^{0^+}\tau^{\perp}$	${}^{0^-}\sigma^{\parallel}$
${}^{0^+}\sigma^{\parallel}\dagger$	$\frac{1}{6k^2 r_{3}}$	0	0	0
${}^{0^+}\tau^{\parallel}\dagger$	0	0	0	0
${}^{0^+}\tau^{\perp}\dagger$	0	0	0	0
${}^{0^-}\sigma^{\parallel}\dagger$	0	0	0	$\frac{1}{k^2 r_{2}-t_{1}}$

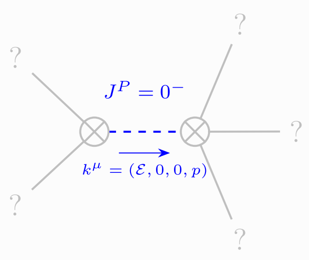
	${}^{1^+}\sigma^{\parallel}{}_{\alpha\beta}$	${}^{1^+}\sigma^{\perp}{}_{\alpha\beta}$	${}^{1^+}\tau^{\parallel}{}_{\alpha\beta}$	${}^{1^-}\sigma^{\parallel}{}_{\alpha}$	${}^{1^-}\sigma^{\perp}{}_{\alpha}$	${}^{1^-}\tau^{\parallel}{}_{\alpha}$	${}^{1^-}\tau^{\perp}{}_{\alpha}$
${}^{1^+}\sigma^{\parallel}\dagger^{\alpha\beta}$	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
${}^{1^+}\sigma^{\perp}\dagger^{\alpha\beta}$	$-\frac{\sqrt{2}}{t_{1}+k^2 t_{1}}$	$\frac{-2k^2\left(2r_{3}+r_{5}\right)+t_{1}}{(1+k^2)^2 t_{1}^2}$	$\frac{-2ik^3\left(2r_{3}+r_{5}\right)+ikt_{1}}{(1+k^2)^2 t_{1}^2}$	0	0	0	0
${}^{1^+}\tau^{\parallel}\dagger^{\alpha\beta}$	$\frac{i\sqrt{2}\,k}{t_{1}+k^2 t_{1}}$	$\frac{i\left(2k^3\left(2r_{3}+r_{5}\right)-kt_{1}\right)}{(1+k^2)^2 t_{1}^2}$	$\frac{-2k^4\left(2r_{3}+r_{5}\right)+k^2 t_{1}}{(1+k^2)^2 t_{1}^2}$	0	0	0	0
${}^{1^-}\sigma^{\parallel}\dagger^{\alpha}$	0	0	0	$\frac{1}{k^2\left(2r_{3}+r_{5}\right)}$	$-\frac{1}{\sqrt{2}\left(k^2+2k^4\right)\left(2r_{3}+r_{5}\right)}$	0	$-\frac{i}{k\left(1+2k^2\right)\left(2r_{3}+r_{5}\right)}$
${}^{1^-}\sigma^{\perp}\dagger^{\alpha}$	0	0	0	$-\frac{1}{\sqrt{2}\left(k^2+2k^4\right)\left(2r_{3}+r_{5}\right)}$	$\frac{6k^2\left(2r_{3}+r_{5}\right)+t_{1}}{2\left(k+2k^3\right)^2\left(2r_{3}+r_{5}\right)t_{1}}$	0	$\frac{i\left(6k^2\left(2r_{3}+r_{5}\right)+t_{1}\right)}{\sqrt{2}\,k\left(1+2k^2\right)^2\left(2r_{3}+r_{5}\right)t_{1}}$
${}^{1^-}\tau^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0
${}^{1^-}\tau^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{i}{k\left(1+2k^2\right)\left(2r_{3}+r_{5}\right)}$	$-\frac{i\left(6k^2\left(2r_{3}+r_{5}\right)+t_{1}\right)}{\sqrt{2}\,k\left(1+2k^2\right)^2\left(2r_{3}+r_{5}\right)t_{1}}$	0	$\frac{6k^2\left(2r_{3}+r_{5}\right)+t_{1}}{\left(1+2k^2\right)^2\left(2r_{3}+r_{5}\right)t_{1}}$

	${}^{2^+}\sigma^{\parallel}{}_{\alpha\beta}$	${}^{2^+}\tau^{\parallel}{}_{\alpha\beta}$	${}^{2^-}\sigma^{\parallel}{}_{\alpha\beta\chi}$
${}^{2^+}\sigma^{\parallel}\dagger^{\alpha\beta}$	$\frac{2}{\left(1+2k^2\right)^2 t_{1}}$	$-\frac{2i\sqrt{2}\,k}{\left(1+2k^2\right)^2 t_{1}}$	0
${}^{2^+}\tau^{\parallel}\dagger^{\alpha\beta}$	$\frac{2i\sqrt{2}\,k}{\left(1+2k^2\right)^2 t_{1}}$	$\frac{4k^2}{\left(1+2k^2\right)^2 t_{1}}$	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
${}^{0^+}\tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau(\Delta+\mathcal{K})^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha}{}_{\alpha}$	1
$2ik\ {}^{1^-}\sigma^{\perp\alpha} + {}^{1^-}\tau^{\perp\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	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
$ik\ {}^{1^+}\sigma^{\perp\alpha\beta} + {}^{1^+}\tau^{\parallel\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta} + 2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} == \partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta} + \partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi} + \partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	3
$-2ik\ {}^{2^+}\sigma^{\parallel\alpha\beta} + {}^{2^+}\tau^{\parallel\alpha\beta} == 0$	$-i\Big(4\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\delta} + 2\,\partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi} - 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} - 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta} - 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi} - 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha} + 4i\,k^{\chi}\,\partial_{\epsilon}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\sigma^{\delta}{}_{\delta}{}^{\epsilon} - 6i\,k^{\chi}\,\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon} - 6i\,k^{\chi}\,\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon} + 6i\,k^{\chi}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\sigma^{\alpha\beta\delta} + 6i\,k^{\chi}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\sigma^{\beta\alpha\delta} + 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\tau(\Delta+\mathcal{K})^{\chi\delta} - 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi} - 4i\,\eta^{\alpha\beta}\,k^{\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\chi}\sigma^{\delta}{}_{\delta}{}^{\epsilon}\Big) == 0$	5
Total expected gauge generators:		16

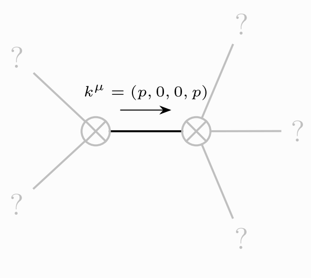
Massive spectrum



Massive particle

Pole residue:	$-\frac{1}{r_{2}} > 0$
Square mass:	$\frac{t_{1}}{r_{2}} > 0$
Spin:	0
Parity:	Odd

Massless spectrum



Massless particle

Pole residue:	$-\frac{7}{2r_{3}+r_{5}} + \frac{-2t_{1}p^2-4(2r_{3}+r_{5})p^4}{t_{1}^2} > 0$
Polarisations:	2

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

$r_{3} \in \mathbb{R}\ \&\&\ r_{2} < 0\ \&\&\ t_{1} < 0\ \&\&\ r_{5} < -2 r_{3}$

Validity assumptions

(Not yet implemented in PSALTer)