PSALTer results panel
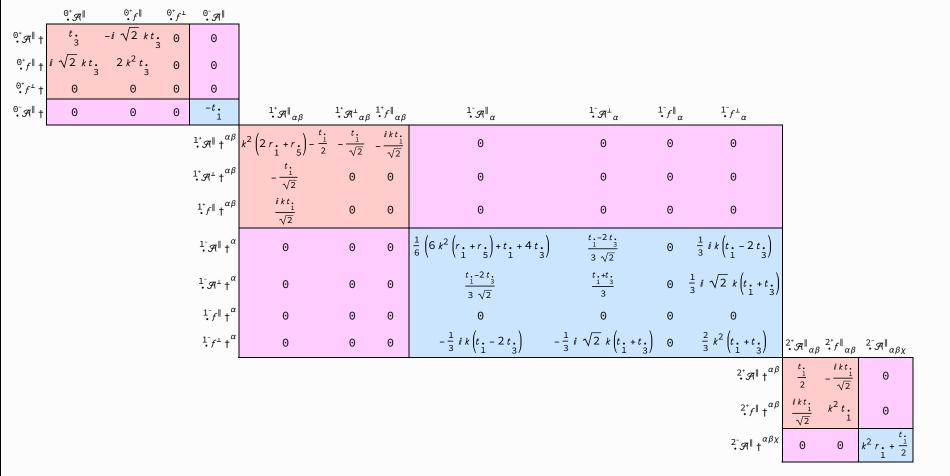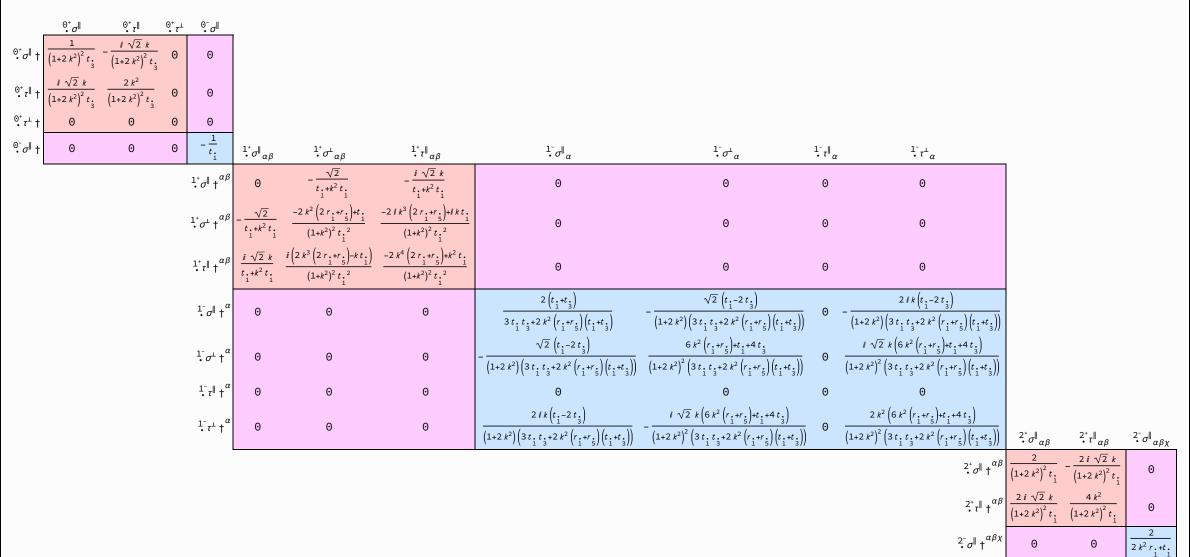
$S ==$

$$\iiiint\left(\frac{1}{6}\left(2\left(t_1-2t_3\right)\mathcal{A}^{\alpha\iota}{}_\alpha \mathcal{A}_{\iota}{}^{\theta}{}_\theta + 6\,\mathcal{A}^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + 6\,f^{\alpha\beta}{}_\tau(\Delta+\mathcal{K})_{\alpha\beta} - 4t_1\,\mathcal{A}_\alpha{}^\theta{}_\theta\,\partial_\iota f^{\alpha\iota} + 8t_3\,\mathcal{A}_\alpha{}^\theta{}_\theta\,\partial_\iota f^{\alpha\iota} + 4t_1\,\mathcal{A}_{\iota}{}^\theta{}_\theta\,\partial^\iota f^{\alpha\iota} - 8t_3\,\mathcal{A}_{\iota}{}^\theta{}_\theta\,\partial^\iota f^{\alpha\iota} - 2t_1\,\partial^\iota f^\theta{}_\theta\,\partial^\iota f^{\alpha\iota} + 4t_3\,\partial f^\theta{}_\theta\,\partial^\iota f^{\alpha\iota} - 2t_1\,\partial_\theta f^{\alpha\iota}\,\partial_\theta{}^\theta{}_\alpha + 4t_3\,\partial_\theta f^{\alpha\iota}\,\partial_\theta{}^\theta{}_\alpha + 4t_1\,\partial^\iota f^\alpha{}_\theta\,\partial_\theta f_{\alpha}{}^\theta - 8t_3\,\partial^\iota f^\alpha{}_\theta\,\partial_\theta f_{\alpha}{}^\theta - 8r_1\,\partial_\beta\mathcal{A}_{\alpha\iota\theta}\partial^\theta\mathcal{A}^{\alpha\beta\iota} + 4r_1\,\partial_\beta\mathcal{A}_{\alpha\theta\iota}\partial^\theta\mathcal{A}^{\alpha\beta\iota} - 16r_1\,\partial_\beta\mathcal{A}_{\iota\theta\alpha}\partial^\theta\mathcal{A}^{\alpha\beta\iota} - 4r_1\,\partial_\theta\mathcal{A}_{\alpha\beta\beta}\partial^\theta\mathcal{A}^{\alpha\beta\iota} + 4r_1\,\partial_\theta\mathcal{A}_{\alpha\beta\iota}\partial^\theta\mathcal{A}^{\alpha\beta\iota} + 4r_1\,\partial_\theta\mathcal{A}_{\alpha\iota\beta}\partial^\theta\mathcal{A}^{\alpha\beta\iota} + 6r_5\,\partial_\iota\mathcal{A}_\theta{}^\iota{}_\kappa\partial^\theta\mathcal{A}^{\alpha\iota}{}_\alpha - 6r_5\,\partial_\theta\mathcal{A}^\iota{}_\iota{}^\kappa\partial^\theta\mathcal{A}^{\alpha\iota}{}_\alpha - 6t_1\,\partial_\alpha f_{\iota\theta}\partial^\theta f^{\alpha\iota} - 3t_1\,\partial_\theta f_{\theta\iota}\partial^\theta f^{\alpha\iota} + 3t_1\,\partial_\iota f_{\alpha\theta}\partial^\theta f^{\alpha\iota} + 3t_1\,\partial_\theta f_{\alpha\iota}\partial^\theta f^{\alpha\iota} + 3t_1\,\partial_\iota f_{\iota\alpha}\partial^\theta f^{\alpha\iota} + 6t_1\,\mathcal{A}_{\alpha\theta\iota}\left(\mathcal{A}^{\alpha\iota\theta}+2\,\partial^\theta f^{\alpha\iota}\right) - 6r_5\,\partial_\alpha\mathcal{A}^{\alpha\iota\theta}\partial_\kappa\mathcal{A}_{\iota}{}^\kappa{}_\theta + 12r_5\,\partial^\theta\mathcal{A}^{\alpha\iota}{}_\alpha\partial_\kappa\mathcal{A}_{\iota}{}^\kappa{}_\theta + 6r_5\,\partial_\alpha\mathcal{A}^{\alpha\iota\theta}\partial_\kappa\mathcal{A}_\theta{}^\kappa{}_\iota - 12r_5\,\partial^\theta\mathcal{A}^{\alpha\iota}{}_\alpha\partial_\kappa\mathcal{A}_\theta{}^\kappa{}_\iota\right)\right)[t,x,y,z]\,dz\,dy\,dx\,dt$$

Wave operator

Saturated propagator
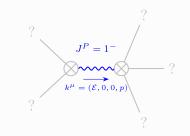
Source constraints

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

Massive spectrum

$J^P = 1^-$
$k^\mu = (\mathcal{E}, 0, 0, p)$

Massive particle

Pole residue:	$-\frac{3\left(-2t_1t_3(t_1+t_3)+r_1(t_1{}^2+2t_3{}^2)+r_5(t_1{}^2+2t_3{}^2)\right)}{2\left(r_1+r_5\right)(t_1+t_3)\left(-3t_1t_3+r_1(t_1+t_3)+r_5(t_1+t_3)\right)} > 0$
Square mass:	$-\frac{3t_1t_3}{2\left(r_1+r_5\right)(t_1+t_3)} > 0$
Spin:	1
Parity:	Odd

$J^P = 2^-$
$k^\mu = (\mathcal{E}, 0, 0, p)$

Massive particle

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

Massless spectrum

(There are no massless particles)

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

$\left(t_3 < 0\,\&\&\,0 < t_1 < -t_3\,\&\&\,r_1 < 0\,\&\&\,r_5 < -r_1\right)\|\left(t_3 > 0\,\&\&\,t_1 > 0\,\&\&\,r_1 < 0\,\&\&\,r_5 < -r_1\right)$

Validity assumptions

(Not yet implemented in PSALTer)