PSALTer results panel

S ==

$$\iiiint\Big(\mathcal{A}^{\alpha\beta\chi}\ \sigma_{\alpha\beta\chi} + f^{\alpha\beta}\ \tau\,(\Delta+\mathcal{K})_{\alpha\beta} - \frac{2}{3}\,r_{\cdot 1}\Big(2\,\partial_\beta\mathcal{A}_{\alpha\,\prime\,\theta} - \partial_\beta\mathcal{A}_{\alpha\theta\,\prime} + 4\,\partial_\beta\mathcal{A}_{\prime\,\theta\alpha} + \partial_\prime\mathcal{A}_{\alpha\beta\theta} - \partial_\theta\mathcal{A}_{\alpha\beta\,\prime} - \partial_\theta\mathcal{A}_{\alpha\,\prime\,\beta}\Big)\partial^\theta\mathcal{A}^{\alpha\beta\,\prime} + \frac{1}{2}\,t_{\cdot 1}\Big(2\ \mathcal{A}^{\alpha\,\prime}{}_{\alpha}\ \mathcal{A}_{\prime}{}^{\theta}{}_{\theta} - 4\ \mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\ \partial_\prime f^{\alpha\,\prime} + 4\ \mathcal{A}_{\prime}{}^{\theta}{}_{\theta}\ \partial^\prime f^{\alpha}{}_{\alpha} - 2\,\partial_\prime f^{\theta}{}_{\theta}$$
$$\partial^\prime f^{\alpha}{}_{\alpha} - 2\,\partial_\prime f^{\alpha\,\prime}\,\partial_\theta f_{\alpha}{}^{\theta} + 4\,\partial^\prime f^{\alpha}{}_{\alpha}\,\partial_\theta f_{\prime}{}^{\theta} - 2\,\partial_\alpha f_{\prime\,\theta}\,\partial^\theta f^{\alpha\,\prime} - \partial_\alpha f_{\theta\,\prime}\,\partial^\theta f^{\alpha\,\prime} + \partial_\prime f_{\alpha\theta}\,\partial^\theta f^{\alpha\,\prime} + \partial_\theta f_{\alpha\,\prime}\,\partial^\theta f^{\alpha\,\prime} + \partial_\theta f_{\prime\,\alpha}\,\partial^\theta f^{\alpha\,\prime} + 2\ \mathcal{A}_{\alpha\theta\,\prime}\ \Big(\mathcal{A}^{\alpha\,\prime\,\theta} + 2\,\partial^\theta f^{\alpha\,\prime}\Big)\Big) +$$
$$r_{\cdot 5}\Big(\partial_\prime\mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\,\partial^\theta\mathcal{A}^{\alpha\,\prime}{}_{\alpha} - \partial_\theta\mathcal{A}_{\prime}{}^{\kappa}{}_{\kappa}\,\partial^\theta\mathcal{A}^{\alpha\,\prime}{}_{\alpha} - \Big(\partial_\alpha\mathcal{A}^{\alpha\,\prime\,\theta} - 2\,\partial^\theta\mathcal{A}^{\alpha\,\prime}{}_{\alpha}\Big)\Big(\partial_\kappa\mathcal{A}_{\prime}{}^{\kappa}{}_{\theta} - \partial_\kappa\mathcal{A}_{\theta}{}^{\kappa}{}_{\prime}\Big)\Big)\Big)[t,\ x,\ y,\ z]\,d\prime z\,d\prime y\,d\prime x\,d\prime t$$

Wave operator

	$0^+_\cdot\mathcal{A}^\parallel$	$0^+_\cdot f^\parallel$	$0^+_\cdot f^\perp$	$0^-_\cdot\mathcal{A}^\parallel$
$0^+_\cdot\mathcal{A}^\parallel\,\dagger$	$-t_{\cdot 1}$	$i\sqrt{2}\,k\,t_{\cdot 1}$	0	0
$0^+_\cdot f^\parallel\,\dagger$	$-i\sqrt{2}\,k\,t_{\cdot 1}$	$-2k^2\,t_{\cdot 1}$	0	0
$0^+_\cdot f^\perp\,\dagger$	0	0	0	0
$0^-_\cdot\mathcal{A}^\parallel\,\dagger$	0	0	0	$-t_{\cdot 1}$

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

	$2^+_\cdot\mathcal{A}^\parallel{}_{\alpha\beta}$	$2^+_\cdot f^\parallel{}_{\alpha\beta}$	$2^-_\cdot\mathcal{A}^\parallel{}_{\alpha\beta\chi}$
$2^+_\cdot\mathcal{A}^\parallel\,\dagger^{\alpha\beta}$	$\frac{t_{\cdot 1}}{2}$	$-\frac{ikt_{\cdot 1}}{\sqrt{2}}$	0
$2^+_\cdot f^\parallel\,\dagger^{\alpha\beta}$	$\frac{ikt_{\cdot 1}}{\sqrt{2}}$	$k^2\,t_{\cdot 1}$	0
$2^-_\cdot\mathcal{A}^\parallel\,\dagger^{\alpha\beta\chi}$	0	0	$k^2\,r_{\cdot 1}+\frac{t_{\cdot 1}}{2}$

Saturated propagator

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

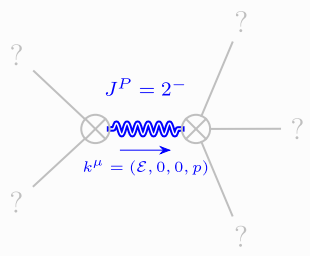
	$1^+_\cdot\sigma^\parallel{}_{\alpha\beta}$	$1^+_\cdot\sigma^\perp{}_{\alpha\beta}$	$1^+_\cdot\tau^\parallel{}_{\alpha\beta}$	$1^-_\cdot\sigma^\parallel{}_{\alpha}$	$1^-_\cdot\sigma^\perp{}_{\alpha}$	$1^-_\cdot\tau^\parallel{}_{\alpha}$	$1^-_\cdot\tau^\perp{}_{\alpha}$
$1^+_\cdot\sigma^\parallel\,\dagger^{\alpha\beta}$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

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

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

Massive spectrum



Massive particle

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

Massless spectrum

(There are no massless particles)

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

$r_{\cdot i} < 0\ \&\&\ t_{\cdot i} > 0$

Validity assumptions

(Not yet implemented in PSALTer)