PSALTer results panel

$$S == \int\int\int\int\Big(\mathcal{A}^{\alpha\beta\chi}{}_{\sigma_{\alpha\beta\chi}} + f^{\alpha\beta}{}_{\tau\,(\Delta+\mathcal{K})_{\alpha\beta}} - \frac{2}{3}\, t_{\cdot 3}\Big(\mathcal{A}^{\alpha\prime}{}_{\alpha}\,\mathcal{A}_{\prime}{}^{\theta}{}_{\theta} - 2\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_{\prime} f^{\alpha\prime} + 2\,\mathcal{A}_{\prime}{}^{\theta}{}_{\theta}\,\partial^{\prime} f^{\alpha}{}_{\alpha} - \partial_{\prime} f^{\theta}{}_{\theta}\,\partial^{\prime} f^{\alpha}{}_{\alpha} - \partial_{\prime} f^{\alpha\prime}\,\partial_{\theta} f_{\alpha}{}^{\theta} + 2\,\partial^{\prime} f^{\alpha}{}_{\alpha}\,\partial_{\theta} f_{\prime}{}^{\theta}\Big) - \frac{1}{2}\, r_{\cdot 3}\Big(\partial_{\beta}\mathcal{A}_{\prime}{}^{\theta}{}_{\theta}\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_{\prime}\mathcal{A}_{\beta}{}^{\theta}{}_{\theta}\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha} + \partial_{\alpha}\mathcal{A}^{\alpha\beta\prime}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\prime} - 2\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\prime} + \partial_{\alpha}\mathcal{A}^{\alpha\beta\prime}\,\partial_{\theta}\mathcal{A}_{\prime}{}^{\theta}{}_{\beta} - 2\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\prime}{}^{\theta}{}_{\beta} + 8\,\partial_{\beta}\mathcal{A}_{\prime\theta\alpha}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\prime}\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]\,dz\,dy\,dx\,dt$$

Wave operator

	$\overset{0^+}{\cdot}\mathcal{A}^{\parallel}$	$\overset{0^+}{\cdot}f^{\parallel}$	$\overset{0^+}{\cdot}f^{\perp}$	$\overset{0^-}{\cdot}\mathcal{A}^{\parallel}$
$\overset{0^+}{\cdot}\mathcal{A}^{\parallel}\,\dagger$	$t_{\cdot 3}$	$-i\sqrt{2}\,k\,t_{\cdot 3}$	0	0
$\overset{0^+}{\cdot}f^{\parallel}\,\dagger$	$i\sqrt{2}\,k\,t_{\cdot 3}$	$2k^2 t_{\cdot 3}$	0	0
$\overset{0^+}{\cdot}f^{\perp}\,\dagger$	0	0	0	0
$\overset{0^-}{\cdot}\mathcal{A}^{\parallel}\,\dagger$	0	0	0	0

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

	$\overset{2^+}{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$\overset{2^+}{\cdot}f^{\parallel}{}_{\alpha\beta}$	$\overset{2^-}{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$\overset{2^+}{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{3k^2 r_{\cdot 3}}{2}$	0	0
$\overset{2^+}{\cdot}f^{\parallel}\,\dagger^{\alpha\beta}$	0	0	0
$\overset{2^-}{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	0

Saturated propagator

	$\overset{0^+}{\cdot}\sigma^{\parallel}$	$\overset{0^+}{\cdot}\tau^{\parallel}$	$\overset{0^+}{\cdot}\tau^{\perp}$	$\overset{0^-}{\cdot}\sigma^{\parallel}$
$\overset{0^+}{\cdot}\sigma^{\parallel}\,\dagger$	$\frac{1}{\left(1+2k^2\right)^2 t_{\cdot 3}}$	$-\frac{i\sqrt{2}\,k}{\left(1+2k^2\right)^2 t_{\cdot 3}}$	0	0
$\overset{0^+}{\cdot}\tau^{\parallel}\,\dagger$	$\frac{i\sqrt{2}\,k}{\left(1+2k^2\right)^2 t_{\cdot 3}}$	$\frac{2k^2}{\left(1+2k^2\right)^2 t_{\cdot 3}}$	0	0
$\overset{0^+}{\cdot}\tau^{\perp}\,\dagger$	0	0	0	0
$\overset{0^-}{\cdot}\sigma^{\parallel}\,\dagger$	0	0	0	0

	$\overset{1^+}{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$\overset{1^+}{\cdot}\sigma^{\perp}{}_{\alpha\beta}$	$\overset{1^+}{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$\overset{1^-}{\cdot}\sigma^{\parallel}{}_{\alpha}$	$\overset{1^-}{\cdot}\sigma^{\perp}{}_{\alpha}$	$\overset{1^-}{\cdot}\tau^{\parallel}{}_{\alpha}$	$\overset{1^-}{\cdot}\tau^{\perp}{}_{\alpha}$
$\overset{1^+}{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{1}{k^2\left(2\,r_{\cdot 3}+r_{\cdot 5}\right)}$	0	0	0	0	0	0
$\overset{1^+}{\cdot}\sigma^{\perp}\,\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\overset{1^+}{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$\overset{1^-}{\cdot}\sigma^{\parallel}\,\dagger^{\alpha}$	0	0	0	$\frac{2}{k^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)}$	$\frac{2\sqrt{2}}{k^2\left(1+2k^2\right)\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)}$	0	$\frac{4i}{k\left(1+2k^2\right)\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)}$
$\overset{1^-}{\cdot}\sigma^{\perp}\,\dagger^{\alpha}$	0	0	0	$\frac{2\sqrt{2}}{k^2\left(1+2k^2\right)\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)}$	$\frac{3k^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)+4\,t_{\cdot 3}}{\left(k+2k^3\right)^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)t_{\cdot 3}}$	0	$\frac{i\sqrt{2}\left(3k^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)+4\,t_{\cdot 3}\right)}{k\left(1+2k^2\right)^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)t_{\cdot 3}}$
$\overset{1^-}{\cdot}\tau^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$\overset{1^-}{\cdot}\tau^{\perp}\,\dagger^{\alpha}$	0	0	0	$-\frac{4i}{k\left(1+2k^2\right)\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)}$	$-\frac{i\sqrt{2}\left(3k^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)+4\,t_{\cdot 3}\right)}{k\left(1+2k^2\right)^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)t_{\cdot 3}}$	0	$\frac{6k^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)+8\,t_{\cdot 3}}{\left(1+2k^2\right)^2\left(r_{\cdot 3}+2\,r_{\cdot 5}\right)t_{\cdot 3}}$

	$\overset{2^+}{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$\overset{2^+}{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$\overset{2^-}{\cdot}\sigma^{\parallel}{}_{\alpha\beta\chi}$
$\overset{2^+}{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{2}{3k^2 r_{\cdot 3}}$	0	0
$\overset{2^+}{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	0	0	0
$\overset{2^-}{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	0

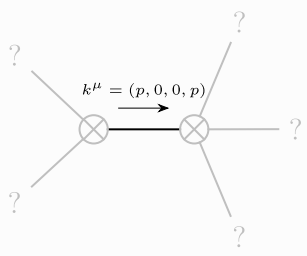
Source constraints

Spin-parity form	Covariant form	Multiplicities
$\overset{0^-}{\cdot}\sigma^{\parallel} == 0$	$\epsilon\eta_{\alpha\beta\chi\delta}\,\partial^{\delta}\sigma^{\alpha\beta\chi} == 0$	1
$\overset{0^+}{\cdot}\tau^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$-2\,i\,k\,\overset{0^+}{\cdot}\sigma^{\parallel} + \overset{0^+}{\cdot}\tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau\,(\Delta+\mathcal{K})^{\alpha}{}_{\alpha} + 2\,\partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha}{}_{\alpha}{}^{\beta}$	1
$2\,i\,k\,\overset{1^-}{\cdot}\sigma^{\perp}{}^{\alpha} + \overset{1^-}{\cdot}\tau^{\perp}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta\tau}\,(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	3
$\overset{1^-}{\cdot}\tau^{\parallel}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta\tau}\,(\Delta+\mathcal{K})^{\beta\alpha}$	3
$\overset{1^+}{\cdot}\tau^{\parallel}{}^{\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == \partial_{\chi}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\chi\beta} + \partial_{\chi}\partial^{\beta}\tau\,(\Delta+\mathcal{K})^{\alpha\chi} + \partial_{\chi}\partial^{\chi}\tau\,(\Delta+\mathcal{K})^{\beta\alpha}$	3
$\overset{1^+}{\cdot}\sigma^{\perp}{}^{\alpha\beta} == 0$	$\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta} + \partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} == \partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	3
$\overset{2^-}{\cdot}\sigma^{\parallel}{}^{\alpha\beta\chi} == 0$	$3\,\partial_{\epsilon}\partial_{\delta}\partial^{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon} + 3\,\partial_{\epsilon}\partial^{\epsilon}\partial^{\chi}\partial^{\alpha}\sigma^{\delta\beta}{}_{\delta} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\alpha\chi\delta} + 4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\chi\alpha\delta} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\delta\alpha\chi} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\sigma^{\beta\alpha\delta} + 4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\alpha\beta\chi} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\beta\alpha\chi} + 3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\alpha}\sigma^{\delta}{}_{\delta}{}^{\epsilon} + 3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\delta}\sigma^{\delta\beta\epsilon} + 3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\epsilon}\sigma^{\delta\alpha}{}_{\delta} == 3\,\partial_{\epsilon}\partial_{\delta}\partial^{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon} + 3\,\partial_{\epsilon}\partial^{\epsilon}\partial^{\chi}\partial^{\beta}\sigma^{\delta\alpha}{}_{\delta} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\beta\chi\delta} + 4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\chi\beta\delta} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\delta\beta\chi} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\sigma^{\alpha\beta\delta} + 2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\beta\alpha\chi} + 4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\chi\alpha\beta} + 3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\beta}\sigma^{\delta}{}_{\delta}{}^{\epsilon} + 3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\delta}\sigma^{\delta\alpha\epsilon} + 3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\epsilon}\sigma^{\delta\beta}{}_{\delta}$	5
$\overset{2^+}{\cdot}\tau^{\parallel}{}^{\alpha\beta} == 0$	$4\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\chi\delta} + 2\,\partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\chi}{}_{\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau\,(\Delta+\mathcal{K})^{\alpha\beta} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau\,(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\tau\,(\Delta+\mathcal{K})^{\chi\delta} == 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\beta\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau\,(\Delta+\mathcal{K})^{\chi\beta} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau\,(\Delta+\mathcal{K})^{\alpha\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\tau\,(\Delta+\mathcal{K})^{\chi}{}_{\chi}$	5
Total expected gauge generators:			25

Massive spectrum

(There are no massive particles)

Massless spectrum



Massless particle

Pole residue:	$-\frac{26}{r_{\cdot 3}} + \frac{39}{2r_{\cdot 3}+r_{\cdot 5}} - \frac{216}{r_{\cdot 3}+2r_{\cdot 5}} > 0$
Polarisations:	2

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

$$\left(r_{\cdot 3} < 0 \;\&\&\; \left(r_{\cdot 5} < -\frac{r_{\cdot 3}}{2} \,\|\, r_{\cdot 5} > -2\,r_{\cdot 3}\right)\right) \| \left(r_{\cdot 3} > 0 \;\&\&\; -2\,r_{\cdot 3} < r_{\cdot 5} < -\frac{r_{\cdot 3}}{2}\right)$$

Validity assumptions

(Not yet implemented in PSALTer)