PSALTer results panel

$$\mathcal{S} == \iiiint\Big(\tfrac{1}{6}\Big(-4\,t_{3}\,\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}+8\,t_{3}\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_{\iota}f^{\alpha\iota}-15\,r_{3}\,\partial_{\beta}\mathcal{A}_{\iota}{}^{\theta}{}_{\theta}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}+9\,r_{3}\,\partial_{\iota}\mathcal{A}_{\beta}{}^{\theta}{}_{\theta}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}-8\,t_{3}\,\mathcal{A}_{\iota}{}^{\theta}{}_{\theta}\,\partial^{\iota}f^{\alpha}{}_{\alpha}+4\,t_{3}\,\partial_{\iota}f^{\theta}{}_{\theta}\,\partial^{\iota}f^{\alpha}{}_{\alpha}+9\,r_{3}\,\partial_{\alpha}\mathcal{A}^{\alpha\beta\iota}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\iota}-18\,r_{3}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\iota}-15\,r_{3}\,\partial_{\alpha}\mathcal{A}^{\alpha\beta\iota}\,\partial_{\theta}\mathcal{A}_{\iota}{}^{\theta}{}_{\beta}+30\,r_{3}\,\partial^{\iota}\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\partial_{\theta}\mathcal{A}_{\iota}{}^{\theta}{}_{\beta}+4\,t_{3}\,\partial_{\iota}f^{\alpha\iota}\,\partial_{\theta}f_{\alpha}{}^{\theta}-8\,t_{3}\,\partial^{\iota}f^{\alpha}{}_{\alpha}\,\partial_{\theta}f_{\iota}{}^{\theta}+8\,r_{2}\,\partial_{\beta}\mathcal{A}_{\alpha\iota\theta}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}-4\,r_{2}\,\partial_{\beta}\mathcal{A}_{\alpha\theta\iota}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}+4\,r_{2}\,\partial_{\beta}\mathcal{A}_{\iota\theta\alpha}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}-24\,r_{3}\,\partial_{\beta}\mathcal{A}_{\iota\theta\alpha}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}-2\,r_{2}\,\partial_{\iota}\mathcal{A}_{\alpha\beta\theta}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}+2\,r_{2}\,\partial_{\theta}\mathcal{A}_{\alpha\beta\iota}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}-4\,r_{2}\,\partial_{\theta}\mathcal{A}_{\alpha\iota\beta}\,\partial^{\theta}\mathcal{A}^{\alpha\beta\iota}+4\,t_{2}\,\mathcal{A}_{\iota\theta\alpha}\,\partial^{\theta}f^{\alpha\iota}+2\,t_{2}\,\partial_{\alpha}f_{\iota\theta}\,\partial^{\theta}f^{\alpha\iota}-t_{2}\,\partial_{\alpha}f_{\theta\iota}\,\partial^{\theta}f^{\alpha\iota}-t_{2}\,\partial_{\iota}f_{\alpha\theta}\,\partial^{\theta}f^{\alpha\iota}+t_{2}\,\partial_{\theta}f_{\alpha\iota}\,\partial^{\theta}f^{\alpha\iota}-t_{2}\,\partial_{\theta}f_{\iota\alpha}\,\partial^{\theta}f^{\alpha\iota}-4\,t_{2}\,\mathcal{A}_{\alpha\theta\iota}\left(\mathcal{A}^{\alpha\iota\theta}+\partial^{\theta}f^{\alpha\iota}\right)+2\,t_{2}\,\mathcal{A}_{\alpha\iota\theta}\left(\mathcal{A}^{\alpha\iota\theta}+2\,\partial^{\theta}f^{\alpha\iota}\right)\Big)\Big)[t,x,y,z]\,dz\,dy\,dx\,dt$$

Wave operator

$$\begin{array}{c|ccc|c}
 & {}^{0^+}\mathcal{A}^{\parallel} & {}^{0^+}f^{\parallel} & {}^{0^+}f^{\perp} & {}^{0^-}\mathcal{A}^{\parallel} \\ \hline
{}^{0^+}\mathcal{A}^{\parallel}\dagger & t_{3} & -i\sqrt{2}\,k\,t_{3} & 0 & 0 \\
{}^{0^+}f^{\parallel}\dagger & i\sqrt{2}\,k\,t_{3} & 2k^{2}t_{3} & 0 & 0 \\
{}^{0^+}f^{\perp}\dagger & 0 & 0 & 0 & 0 \\ \hline
{}^{0^-}\mathcal{A}^{\parallel}\dagger & 0 & 0 & 0 & k^{2}r_{2}+t_{2}
\end{array}$$

$$\begin{array}{c|ccc|cccc}
 & {}^{1^+}\mathcal{A}^{\parallel}{}_{\alpha\beta} & {}^{1^+}\mathcal{A}^{\perp}{}_{\alpha\beta} & {}^{1^+}f^{\parallel}{}_{\alpha\beta} & {}^{1^-}\mathcal{A}^{\parallel}{}_{\alpha} & {}^{1^-}\mathcal{A}^{\perp}{}_{\alpha} & {}^{1^-}f^{\parallel}{}_{\alpha} & {}^{1^-}f^{\perp}{}_{\alpha} \\ \hline
{}^{1^+}\mathcal{A}^{\parallel}\dagger^{\alpha\beta} & \frac{2t_{2}}{3} & \frac{\sqrt{2}\,t_{2}}{3} & \frac{1}{3}i\sqrt{2}\,k\,t_{2} & 0 & 0 & 0 & 0 \\
{}^{1^+}\mathcal{A}^{\perp}\dagger^{\alpha\beta} & \frac{\sqrt{2}\,t_{2}}{3} & \frac{t_{2}}{3} & \frac{i\,k\,t_{2}}{3} & 0 & 0 & 0 & 0 \\
{}^{1^+}f^{\parallel}\dagger^{\alpha\beta} & -\frac{1}{3}i\sqrt{2}\,k\,t_{2} & -\frac{1}{3}i\,k\,t_{2} & \frac{k^{2}t_{2}}{3} & 0 & 0 & 0 & 0 \\ \hline
{}^{1^-}\mathcal{A}^{\parallel}\dagger^{\alpha} & 0 & 0 & 0 & \frac{1}{6}\left(-9k^{2}r_{3}+4t_{3}\right) & -\frac{\sqrt{2}\,t_{3}}{3} & 0 & -\frac{2}{3}i\,k\,t_{3} \\
{}^{1^-}\mathcal{A}^{\perp}\dagger^{\alpha} & 0 & 0 & 0 & -\frac{\sqrt{2}\,t_{3}}{3} & \frac{t_{3}}{3} & 0 & \frac{1}{3}i\sqrt{2}\,k\,t_{3} \\
{}^{1^-}f^{\parallel}\dagger^{\alpha} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
{}^{1^-}f^{\perp}\dagger^{\alpha} & 0 & 0 & 0 & \frac{2i\,k\,t_{3}}{3} & -\frac{1}{3}i\sqrt{2}\,k\,t_{3} & 0 & \frac{2k^{2}t_{3}}{3}
\end{array}$$

$$\begin{array}{c|cc|c}
 & {}^{2^+}\mathcal{A}^{\parallel}{}_{\alpha\beta} & {}^{2^+}f^{\parallel}{}_{\alpha\beta} & {}^{2^-}\mathcal{A}^{\parallel}{}_{\alpha\beta\chi} \\ \hline
{}^{2^+}\mathcal{A}^{\parallel}\dagger^{\alpha\beta} & -\frac{3k^{2}r_{3}}{2} & 0 & 0 \\
{}^{2^+}f^{\parallel}\dagger^{\alpha\beta} & 0 & 0 & 0 \\ \hline
{}^{2^-}\mathcal{A}^{\parallel}\dagger^{\alpha\beta\chi} & 0 & 0 & 0
\end{array}$$

Saturated propagator

$$\begin{array}{c|ccc|c}
 & {}^{0^+}\sigma^{\parallel} & {}^{0^+}\tau^{\parallel} & {}^{0^+}\tau^{\perp} & {}^{0^-}\sigma^{\parallel} \\ \hline
{}^{0^+}\sigma^{\parallel}\dagger & \frac{1}{(1+2k^{2})^{2}t_{3}} & -\frac{i\sqrt{2}\,k}{(1+2k^{2})^{2}t_{3}} & 0 & 0 \\
{}^{0^+}\tau^{\parallel}\dagger & \frac{i\sqrt{2}\,k}{(1+2k^{2})^{2}t_{3}} & \frac{2k^{2}}{(1+2k^{2})^{2}t_{3}} & 0 & 0 \\
{}^{0^+}\tau^{\perp}\dagger & 0 & 0 & 0 & 0 \\ \hline
{}^{0^-}\sigma^{\parallel}\dagger & 0 & 0 & 0 & \frac{1}{k^{2}r_{2}+t_{2}}
\end{array}$$

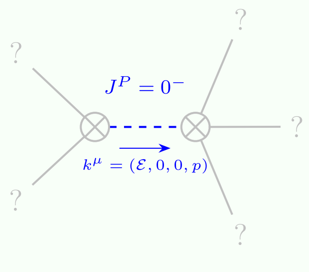
$$\begin{array}{c|ccc|cccc}
 & {}^{1^+}\sigma^{\parallel}{}_{\alpha\beta} & {}^{1^+}\sigma^{\perp}{}_{\alpha\beta} & {}^{1^+}\tau^{\parallel}{}_{\alpha\beta} & {}^{1^-}\sigma^{\parallel}{}_{\alpha} & {}^{1^-}\sigma^{\perp}{}_{\alpha} & {}^{1^-}\tau^{\parallel}{}_{\alpha} & {}^{1^-}\tau^{\perp}{}_{\alpha} \\ \hline
{}^{1^+}\sigma^{\parallel}\dagger^{\alpha\beta} & \frac{6}{(3+k^{2})^{2}t_{2}} & \frac{3\sqrt{2}}{(3+k^{2})^{2}t_{2}} & \frac{3i\sqrt{2}\,k}{(3+k^{2})^{2}t_{2}} & 0 & 0 & 0 & 0 \\
{}^{1^+}\sigma^{\perp}\dagger^{\alpha\beta} & \frac{3\sqrt{2}}{(3+k^{2})^{2}t_{2}} & \frac{3}{(3+k^{2})^{2}t_{2}} & \frac{3i\,k}{(3+k^{2})^{2}t_{2}} & 0 & 0 & 0 & 0 \\
{}^{1^+}\tau^{\parallel}\dagger^{\alpha\beta} & -\frac{3i\sqrt{2}\,k}{(3+k^{2})^{2}t_{2}} & -\frac{3i\,k}{(3+k^{2})^{2}t_{2}} & \frac{3k^{2}}{(3+k^{2})^{2}t_{2}} & 0 & 0 & 0 & 0 \\ \hline
{}^{1^-}\sigma^{\parallel}\dagger^{\alpha} & 0 & 0 & 0 & -\frac{2}{3k^{2}r_{3}} & -\frac{2\sqrt{2}}{3k^{2}r_{3}+6k^{4}r_{3}} & 0 & -\frac{4i}{3k\,r_{3}+6k^{3}r_{3}} \\
{}^{1^-}\sigma^{\perp}\dagger^{\alpha} & 0 & 0 & 0 & -\frac{2\sqrt{2}}{3k^{2}r_{3}+6k^{4}r_{3}} & \frac{9k^{2}r_{3}-4t_{3}}{3(k+2k^{3})^{2}r_{3}t_{3}} & 0 & \frac{i\sqrt{2}\left(9k^{2}r_{3}-4t_{3}\right)}{3k(1+2k^{2})^{2}r_{3}t_{3}} \\
{}^{1^-}\tau^{\parallel}\dagger^{\alpha} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
{}^{1^-}\tau^{\perp}\dagger^{\alpha} & 0 & 0 & 0 & \frac{4i}{3k\,r_{3}+6k^{3}r_{3}} & -\frac{i\sqrt{2}\left(9k^{2}r_{3}-4t_{3}\right)}{3k(1+2k^{2})^{2}r_{3}t_{3}} & 0 & \frac{2\left(9k^{2}r_{3}-4t_{3}\right)}{3(1+2k^{2})^{2}r_{3}t_{3}}
\end{array}$$

$$\begin{array}{c|cc|c}
 & {}^{2^+}\sigma^{\parallel}{}_{\alpha\beta} & {}^{2^+}\tau^{\parallel}{}_{\alpha\beta} & {}^{2^-}\sigma^{\parallel}{}_{\alpha\beta\chi} \\ \hline
{}^{2^+}\sigma^{\parallel}\dagger^{\alpha\beta} & -\frac{2}{3k^{2}r_{3}} & 0 & 0 \\
{}^{2^+}\tau^{\parallel}\dagger^{\alpha\beta} & 0 & 0 & 0 \\ \hline
{}^{2^-}\sigma^{\parallel}\dagger^{\alpha\beta\chi} & 0 & 0 & 0
\end{array}$$

Source constraints

Spin-parity form	Covariant form	Multiplicities
${}^{0^+}\tau^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\tau(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$-2ik\,{}^{0^+}\sigma^{\parallel}+{}^{0^+}\tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau(\Delta+\mathcal{K})^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha}{}_{\alpha}+2\,\partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha}{}_{\alpha}{}^{\beta}$	1
$2ik\,{}^{1^-}\sigma^{\perp\alpha}+{}^{1^-}\tau^{\perp\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau(\Delta+\mathcal{K})^{\alpha\beta}+2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	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
$ik\,{}^{1^+}\sigma^{\parallel\alpha\beta}+{}^{1^+}\tau^{\parallel\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi}+\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha}+\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta}+\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}+\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\alpha\beta\chi} ==$ $\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta}+\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi}+\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha}+\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta}+\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\beta\alpha\chi}$	3
${}^{1^+}\sigma^{\parallel\alpha\beta} == {}^{1^+}\sigma^{\perp\alpha\beta}$	$3\,\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta}+\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\beta\alpha\chi}+2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} == 3\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}+\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\alpha\beta\chi}$	3
${}^{2^-}\sigma^{\parallel\alpha\beta\chi} == 0$	$3\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon}+3\,\partial_{\epsilon}\partial^{\epsilon}\partial^{\chi}\partial^{\alpha}\sigma^{\beta}{}_{\delta}{}^{\delta}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\alpha\chi\delta}+4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\chi\alpha\delta}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\beta}\sigma^{\delta\alpha\chi}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\sigma^{\beta\alpha\delta}+$ $4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\sigma^{\delta\alpha\beta}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\alpha\beta\chi}+3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\alpha}\sigma^{\epsilon}{}_{\delta}{}^{\delta}+3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\delta}\sigma^{\delta\beta\epsilon}+3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\epsilon}\sigma^{\delta\alpha}{}_{\delta} ==$ $3\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon}+3\,\partial_{\epsilon}\partial^{\epsilon}\partial^{\chi}\partial^{\beta}\sigma^{\delta\alpha}{}_{\delta}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\beta\chi\delta}+4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\chi\beta\delta}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\alpha}\sigma^{\delta\beta\chi}+2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\chi}\sigma^{\alpha\beta\delta}+$ $2\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\beta\alpha\chi}+4\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\sigma^{\chi\alpha\beta}+3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\beta}\sigma^{\epsilon}{}_{\delta}{}^{\delta}+3\,\eta^{\beta\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\delta}\sigma^{\delta\alpha\epsilon}+3\,\eta^{\alpha\chi}\,\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial^{\epsilon}\sigma^{\delta\beta}{}_{\delta}$	5
${}^{2^+}\tau^{\parallel\alpha\beta} == 0$	$4\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\delta}+2\,\partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi}+3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi}+3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha}+2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\tau(\Delta+\mathcal{K})^{\chi\delta} ==$ $3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi}+3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta}+3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha}+3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta}+2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi}$	5
Total expected gauge generators:		24

Massive spectrum



Massive particle

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

Massless spectrum

(No particles)

Unitarity conditions

$r_{2} < 0 \;\&\&\; t_{2} > 0$