PSALTer results panel

$$
\begin{aligned}
\mathcal{S} == \\
\iiiint (&\rho\,\varphi + h^{\alpha\beta}\,\mathcal{T}_{\alpha\beta} + \tfrac{1}{2}\,\alpha_{2}\,\partial_{\alpha}\varphi\,\partial^{\alpha}\varphi + \tfrac{1}{8}\,\alpha_{1}\,(12\,\partial_{\alpha}\partial^{\alpha}\varphi - 4\,\partial_{\alpha}h^{\beta}{}_{\beta}\,\partial^{\alpha}\varphi - 6\,\partial_{\alpha}\varphi\,\partial^{\alpha}\varphi + 4\,\partial^{\alpha}\varphi\,\partial_{\beta}h_{\alpha}{}^{\beta} - 4\,\partial_{\beta}\partial_{\alpha}h^{\alpha\beta} + 4\,\partial_{\beta}\partial^{\beta}h^{\alpha}{}_{\alpha} - \\
&\partial_{\beta}h^{\chi}{}_{\chi}\,\partial^{\beta}h^{\alpha}{}_{\alpha} + 2\,\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\chi}h_{\beta}{}^{\chi} - 2\,\partial_{\beta}h_{\alpha\chi}\,\partial^{\chi}h^{\alpha\beta} + \partial_{\chi}h_{\alpha\beta}\,\partial^{\chi}h^{\alpha\beta}) - \\
&\alpha_{6}\,(4\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 4\,\partial_{\beta}\partial_{\alpha}\varphi\,\partial^{\beta}\partial^{\alpha}\varphi - 4\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\alpha}h_{\beta}{}^{\chi} - 4\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\beta}h_{\alpha}{}^{\chi} + 4\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial^{\chi}h_{\alpha\beta} + \\
&4\,\partial_{\alpha}\partial^{\alpha}\varphi\,(2\,\partial_{\beta}\partial^{\beta}\varphi - \partial_{\chi}\partial_{\beta}h^{\beta\chi} + \partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}) + \partial_{\chi}\partial_{\beta}h^{\delta}{}_{\delta}\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha} + 2\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\beta}h_{\chi}{}^{\delta} + 2\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta} \\
&\partial_{\delta}\partial_{\chi}h_{\beta}{}^{\delta} - 4\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\delta}\partial_{\chi}h_{\beta}{}^{\delta} + \partial_{\chi}\partial^{\chi}h^{\alpha\beta}\,\partial_{\delta}\partial^{\delta}h_{\alpha\beta} - 4\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial^{\delta}h_{\beta\chi} + 2\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\delta}\partial^{\delta}h_{\beta\chi}) + \\
&\alpha_{5}\,(\partial_{\alpha}\partial^{\alpha}\varphi\,(9\,\partial_{\beta}\partial^{\beta}\varphi - 6\,\partial_{\chi}\partial_{\beta}h^{\beta\chi} + 6\,\partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}) + \partial_{\beta}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\beta}\partial^{\beta}h^{\alpha}{}_{\alpha}\,(-2\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\delta}\partial^{\delta}h^{\chi}{}_{\chi})) + \\
&\alpha_{7}\,(\partial_{\alpha}\partial^{\alpha}\varphi\,\partial_{\beta}\partial^{\beta}\varphi + 2\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 2\,\partial_{\beta}\partial_{\alpha}\varphi\,\partial^{\beta}\partial^{\alpha}\varphi - 2\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\alpha}h_{\beta}{}^{\chi} - \\
&2\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\beta}h_{\alpha}{}^{\chi} + 2\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial^{\chi}h_{\alpha\beta} + \partial_{\beta}\partial_{\alpha}h_{\chi\delta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} - \partial_{\chi}\partial_{\beta}h_{\alpha\delta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} - \\
&\partial_{\delta}\partial_{\beta}h_{\alpha\chi}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} + \partial_{\delta}\partial_{\chi}h_{\alpha\beta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta}))[t,x,y,z]\,dz\,dy\,dx\,dt
\end{aligned}
$$

Wave operator

$$
\begin{array}{c|ccc}
 & {}^{0^+}\varphi & {}^{0^+}h^{\perp} & {}^{0^+}h^{\parallel} \\
\hline
{}^{0^+}\varphi^{\dagger} & \frac{1}{4}k^2(-3\alpha_{1}+2(\alpha_{2}+6(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^2)) & 0 & -\frac{1}{4}\sqrt{3}\,k^2(\alpha_{1}-4(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^2) \\
{}^{0^+}h^{\perp\dagger} & 0 & 0 & 0 \\
{}^{0^+}h^{\parallel\dagger} & -\frac{1}{4}\sqrt{3}\,k^2(\alpha_{1}-4(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^2) & 0 & -\frac{\alpha_{1}k^2}{4}+(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^4
\end{array}
$$

$$
\begin{array}{c|c}
 & {}^{1^-}h^{\perp}{}_{\alpha} \\
\hline
{}^{1^-}h^{\perp\dagger\alpha} & 0
\end{array}
\qquad
\begin{array}{c|c}
 & {}^{2^+}h^{\parallel}{}_{\alpha\beta} \\
\hline
{}^{2^+}h^{\parallel\dagger\alpha\beta} & \frac{\alpha_{1}k^2}{8}+(-\alpha_{6}+\alpha_{7})k^4
\end{array}
$$

Saturated propagator

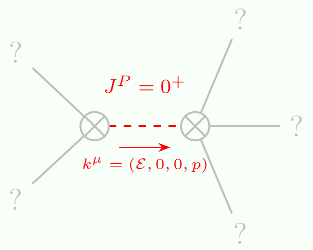
$$
\begin{array}{c|ccc}
 & {}^{0^+}\rho & {}^{0^+}\mathcal{T}^{\perp} & {}^{0^+}\mathcal{T}^{\parallel} \\
\hline
{}^{0^+}\rho^{\dagger} & \frac{2}{\alpha_{2}k^2} & 0 & -\frac{2\sqrt{3}}{\alpha_{2}k^2} \\
{}^{0^+}\mathcal{T}^{\perp\dagger} & 0 & 0 & 0 \\
{}^{0^+}\mathcal{T}^{\parallel\dagger} & -\frac{2\sqrt{3}}{\alpha_{2}k^2} & 0 & \frac{-6\alpha_{1}+4(\alpha_{2}+6(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^2)}{-\alpha_{1}\alpha_{2}k^2+4\alpha_{2}(3\alpha_{5}-4\alpha_{6}+\alpha_{7})k^4}
\end{array}
$$

$$
\begin{array}{c|c}
 & {}^{1^-}\mathcal{T}^{\perp}{}_{\alpha} \\
\hline
{}^{1^-}\mathcal{T}^{\perp\dagger\alpha} & 0
\end{array}
\qquad
\begin{array}{c|c}
 & {}^{2^+}\mathcal{T}^{\parallel}{}_{\alpha\beta} \\
\hline
{}^{2^+}\mathcal{T}^{\parallel\dagger\alpha\beta} & \frac{8}{k^2(\alpha_{1}+8(-\alpha_{6}+\alpha_{7})k^2)}
\end{array}
$$

Source constraints

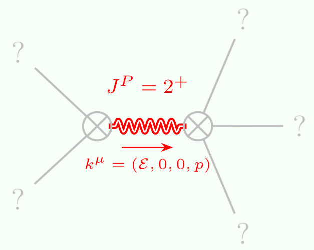
Spin-parity form	Covariant form	Multiplicities
${}^{0^+}\mathcal{T}^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\mathcal{T}^{\alpha\beta} == 0$	1
${}^{1^-}\mathcal{T}^{\perp\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\mathcal{T}^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\mathcal{T}^{\alpha\beta}$	3
Total expected gauge generators:		4

Massive spectrum



Massive particle

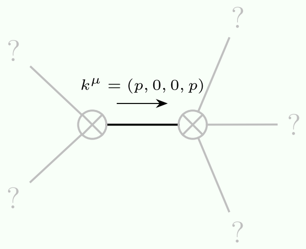
Pole residue:	$\frac{4}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{4(3\alpha_{5}-4\alpha_{6}+\alpha_{7})} > 0$
Spin:	0
Parity:	Even



Massive particle

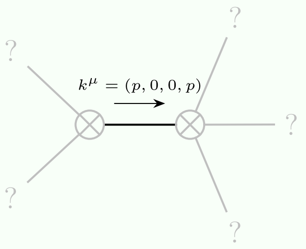
Pole residue:	$-\frac{8}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{8\alpha_{6}-8\alpha_{7}} > 0$
Spin:	2
Parity:	Even

Massless spectrum



Massless particle

Pole residue:	$\frac{p^2}{\alpha_{1}} > 0$
Polarisations:	2



Massless particle

Pole residue:	$\frac{1+2p^2}{\alpha_{2}} > 0$
Polarisations:	1

Unitarity conditions

(Demonstrably impossible)