PSALTer results panel

$$
\begin{aligned}
\mathcal{S} == \iiiint \Big(& \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}\Big(24\,(1+\varphi)\,\partial_{\alpha}\partial^{\alpha}\varphi - 8\,\partial_{\alpha}h^{\beta}{}_{\beta}\,\partial^{\alpha}\varphi + 8\,\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}\Big) - \\
& \alpha_{6}\Big(8\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 16\,\partial_{\beta}\partial_{\alpha}\varphi\,\partial^{\beta}\partial^{\alpha}\varphi - 8\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\alpha}h_{\beta}{}^{\chi} - 8\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\beta}h_{\alpha}{}^{\chi} + 8\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial^{\chi}h_{\alpha\beta} + \\
& 8\,\partial_{\alpha}\partial^{\alpha}\varphi\Big(4\,\partial_{\beta}\partial^{\beta}\varphi - \partial_{\chi}\partial_{\beta}h^{\beta\chi} + \partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}\Big) + \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}\Big) + \\
& \alpha_{5}\Big(12\,\partial_{\alpha}\partial^{\alpha}\varphi\Big(3\,\partial_{\beta}\partial^{\beta}\varphi - \partial_{\chi}\partial_{\beta}h^{\beta\chi} + \partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}\Big) + \partial_{\beta}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\beta}\partial^{\beta}h^{\alpha}{}_{\alpha}\Big(-2\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\delta}\partial^{\delta}h^{\chi}{}_{\chi}\Big)\Big) + \\
& \alpha_{7}\Big(4\,\partial_{\alpha}\partial^{\alpha}\varphi\,\partial_{\beta}\partial^{\beta}\varphi + 4\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 8\,\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} + \\
& \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}\Big)\Big)[t,\ x,\ y,\ z]\,dz\,dy\,dx\,dt
\end{aligned}
$$

Wave operator

$$
\begin{array}{c|ccc|}
 & \overset{0^+}{\cdot}\varphi & \overset{0^+}{\cdot}h^{\perp} & \overset{0^+}{\cdot}h^{\parallel} \\
\hline
\overset{0^+}{\cdot}\varphi\,\dagger & \frac{1}{2}\,k^2\Big(\alpha_{2} + 24\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^2\Big) & 0 & -\frac{1}{2}\,\sqrt{3}\,k^2\Big(\alpha_{1} - 4\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^2\Big) \\
\overset{0^+}{\cdot}h^{\perp}\,\dagger & 0 & 0 & 0 \\
\overset{0^+}{\cdot}h^{\parallel}\,\dagger & -\frac{1}{2}\,\sqrt{3}\,k^2\Big(\alpha_{1} - 4\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^2\Big) & 0 & -\frac{\alpha_{1}\,k^2}{4} + \Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^4 \\
\hline
\end{array}
$$

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

Saturated propagator

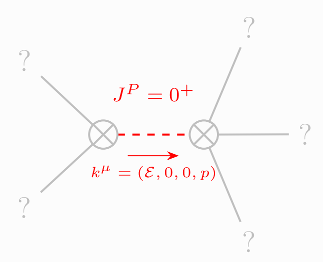
$$
\begin{array}{c|ccc|}
 & \overset{0^+}{\cdot}\rho & \overset{0^+}{\cdot}\mathcal{T}^{\perp} & \overset{0^+}{\cdot}\mathcal{T}^{\parallel} \\
\hline
\overset{0^+}{\cdot}\rho\,\dagger & \frac{2}{\Big(6\,\alpha_{1}+\alpha_{2}\Big)k^2} & 0 & -\frac{4\,\sqrt{3}}{\Big(6\,\alpha_{1}+\alpha_{2}\Big)k^2} \\
\overset{0^+}{\cdot}\mathcal{T}^{\perp}\,\dagger & 0 & 0 & 0 \\
\overset{0^+}{\cdot}\mathcal{T}^{\parallel}\,\dagger & -\frac{4\,\sqrt{3}}{\Big(6\,\alpha_{1}+\alpha_{2}\Big)k^2} & 0 & -\frac{4\Big(\alpha_{2}+24\Big(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7}\Big)k^2\Big)}{\Big(6\,\alpha_{1}+\alpha_{2}\Big)k^2\Big(\alpha_{1}-4\Big(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7}\Big)k^2\Big)} \\
\hline
\end{array}
$$

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

Source constraints

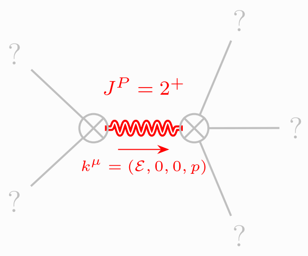
Spin-parity form	Covariant form	Multiplicities
$\overset{0^+}{\cdot}\mathcal{T}^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\mathcal{T}^{\alpha\beta} == 0$	1
$\overset{1^-}{\cdot}\mathcal{T}^{\perp\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\mathcal{T}^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\mathcal{T}^{\alpha\beta}$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

Massive spectrum



Massive particle

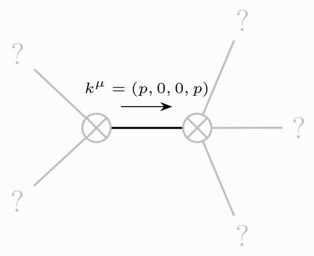
Pole residue:	$\frac{4}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{4\,(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7})} > 0$
Spin:	0
Parity:	Even



Massive particle

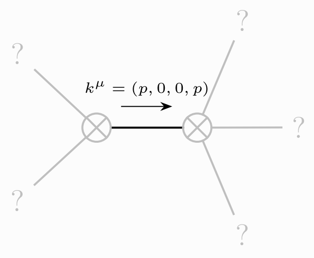
Pole residue:	$-\frac{8}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{8\,\alpha_{6}-8\,\alpha_{7}} > 0$
Spin:	2
Parity:	Even

Massless spectrum



Massless particle

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



Massless particle

Pole residue:	$\frac{1+8\,p^2}{6\,\alpha_{1}+\alpha_{2}} > 0$
Polarisations:	1

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

(Unitarity is demonstrably impossible)

Validity assumptions

(Not yet implemented in PSALTer)