PSALTer results panel

$$\mathcal{S} == \iiiint\Big(\rho\,\varphi + h^{\alpha\beta}\,\mathcal{T}_{\alpha\beta} + \frac{1}{2}\,\alpha_{2}\,\partial_{\alpha}\varphi\,\partial^{\alpha}\varphi + \frac{1}{8}\,\alpha_{1}\Big(36\,(1+2\,\varphi)\,\partial_{\alpha}\partial^{\alpha}\varphi - 12\,\partial_{\alpha}h^{\beta}{}_{\beta}\,\partial^{\alpha}\varphi + 18\,\partial_{\alpha}\varphi\,\partial^{\alpha}\varphi + 12\,\partial^{\alpha}\varphi\,\partial_{\beta}h_{\alpha}{}^{\beta} - 4\,\partial_{\beta}\partial_{\alpha}h^{\alpha\beta} + 4\,\partial_{\beta}\partial^{\beta}h^{\alpha}{}_{\alpha} - \partial_{\beta}h^{\chi}{}_{\chi}\,\partial^{\beta}h^{\alpha}{}_{\alpha} + 2\,\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\chi}h_{\beta}{}^{\chi} - 2\,\partial_{\beta}h_{\alpha\chi}\,\partial^{\chi}h^{\alpha\beta} + \partial_{\chi}h_{\alpha\beta}\,\partial^{\chi}h^{\alpha\beta}\Big) -$$
$$\alpha_{6}\Big(12\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 36\,\partial_{\beta}\partial_{\alpha}\varphi\,\partial^{\beta}\partial^{\alpha}\varphi - 12\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\alpha}h_{\beta}{}^{\chi} - 12\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\beta}h_{\alpha}{}^{\chi} + 12\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial^{\chi}h_{\alpha\beta} + 12\,\partial_{\alpha}\partial^{\alpha}\varphi\,\Big(6\,\partial_{\beta}\partial^{\beta}\varphi - \partial_{\chi}\partial_{\beta}h^{\beta\chi} + \partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}\Big) + \partial_{\chi}\partial_{\beta}h^{\delta}{}_{\delta}\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha} + 2\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\beta}h_{\chi}{}^{\delta} + 2\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\chi}h_{\beta}{}^{\delta} - 4\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\delta}\partial_{\chi}h_{\beta}{}^{\delta} + \partial_{\chi}\partial^{\chi}h^{\alpha\beta}\,\partial_{\delta}\partial^{\delta}h_{\alpha\beta} - 4\,\partial^{\chi}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial^{\delta}h_{\beta\chi} + 2\,\partial^{\chi}\partial^{\beta}h^{\alpha}{}_{\alpha}\,\partial_{\delta}\partial^{\delta}h_{\beta\chi}\Big) +$$
$$\alpha_{5}\Big(9\,\partial_{\alpha}\partial^{\alpha}\varphi\,\Big(9\,\partial_{\beta}\partial^{\beta}\varphi - 2\,\partial_{\chi}\partial_{\beta}h^{\beta\chi} + 2\,\partial_{\chi}\partial^{\chi}h^{\beta}{}_{\beta}\Big) + \partial_{\beta}\partial_{\alpha}h^{\alpha\beta}\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\beta}\partial^{\beta}h^{\alpha}{}_{\alpha}\,\Big(-2\,\partial_{\delta}\partial_{\chi}h^{\chi\delta} + \partial_{\delta}\partial^{\delta}h^{\chi}{}_{\chi}\Big)\Big) +$$
$$\alpha_{7}\Big(9\,\partial_{\alpha}\partial^{\alpha}\varphi\,\partial_{\beta}\partial^{\beta}\varphi + 6\,\partial_{\beta}\partial_{\alpha}h^{\chi}{}_{\chi}\,\partial^{\beta}\partial^{\alpha}\varphi + 18\,\partial_{\beta}\partial_{\alpha}\varphi\,\partial^{\beta}\partial^{\alpha}\varphi - 6\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\alpha}h_{\beta}{}^{\chi} - 6\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial_{\beta}h_{\alpha}{}^{\chi} + 6\,\partial^{\beta}\partial^{\alpha}\varphi\,\partial_{\chi}\partial^{\chi}h_{\alpha\beta} + \partial_{\beta}\partial_{\alpha}h_{\chi\delta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} - \partial_{\chi}\partial_{\beta}h_{\alpha\delta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} - \partial_{\delta}\partial_{\beta}h_{\alpha\chi}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta} + \partial_{\delta}\partial_{\chi}h_{\alpha\beta}\,\partial^{\delta}\partial^{\chi}h^{\alpha\beta}\Big)\Big)[t,\,x,\,y,\,z]\,dz\,dy\,dx\,dt$$

Wave operator

$$\begin{array}{c|ccc|}
 & \overset{0^{+}}{\cdot}\varphi & \overset{0^{+}}{\cdot}h^{\perp} & \overset{0^{+}}{\cdot}h^{\parallel} \\
\hline
\overset{0^{+}}{\cdot}\varphi\,\dagger & \frac{1}{4}\,k^{2}\Big(9\,\alpha_{1} + 2\Big(\alpha_{2} + 54\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^{2}\Big)\Big) & 0 & -\frac{3}{4}\,\sqrt{3}\,k^{2}\Big(\alpha_{1} - 4\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^{2}\Big) \\
\overset{0^{+}}{\cdot}h^{\perp}\,\dagger & 0 & 0 & 0 \\
\overset{0^{+}}{\cdot}h^{\parallel}\,\dagger & -\frac{3}{4}\,\sqrt{3}\,k^{2}\Big(\alpha_{1} - 4\Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^{2}\Big) & 0 & -\frac{\alpha_{1}\,k^{2}}{4} + \Big(3\,\alpha_{5} - 4\,\alpha_{6} + \alpha_{7}\Big)k^{4} \\
\hline
\end{array}$$

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

Saturated propagator

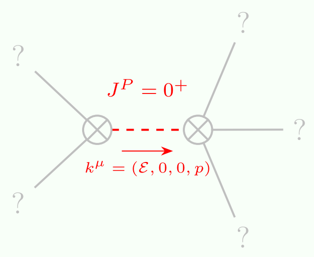
$$\begin{array}{c|ccc|}
 & \overset{0^{+}}{\cdot}\rho & \overset{0^{+}}{\cdot}\mathcal{T}^{\perp} & \overset{0^{+}}{\cdot}\mathcal{T}^{\parallel} \\
\hline
\overset{0^{+}}{\cdot}\rho\,\dagger & \frac{2}{\big(18\,\alpha_{1}+\alpha_{2}\big)k^{2}} & 0 & -\frac{6\,\sqrt{3}}{\big(18\,\alpha_{1}+\alpha_{2}\big)k^{2}} \\
\overset{0^{+}}{\cdot}\mathcal{T}^{\perp}\,\dagger & 0 & 0 & 0 \\
\overset{0^{+}}{\cdot}\mathcal{T}^{\parallel}\,\dagger & -\frac{6\,\sqrt{3}}{\big(18\,\alpha_{1}+\alpha_{2}\big)k^{2}} & 0 & -\frac{2\big(9\,\alpha_{1}+2\big(\alpha_{2}+54\big(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7}\big)k^{2}\big)\big)}{\big(18\,\alpha_{1}+\alpha_{2}\big)k^{2}\big(\alpha_{1}-4\big(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7}\big)k^{2}\big)} \\
\hline
\end{array}$$

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

Source constraints

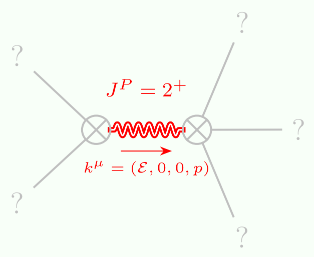
Spin-parity form	Covariant form	Multiplicities
$\overset{0^{+}}{\cdot}\mathcal{T}^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\mathcal{T}^{\alpha\beta} == 0$	1
$\overset{1^{-}}{\cdot}\mathcal{T}^{\perp\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\mathcal{T}^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\mathcal{T}^{\alpha\bet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

Massive spectrum



Massive particle

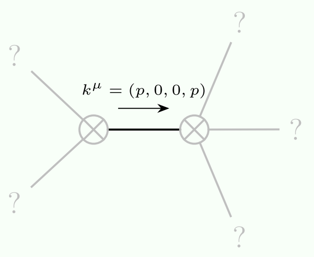
Pole residue:	$\frac{4}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{4\,(3\,\alpha_{5}-4\,\alpha_{6}+\alpha_{7})} > 0$
Spin:	0
Parity:	Even



Massive particle

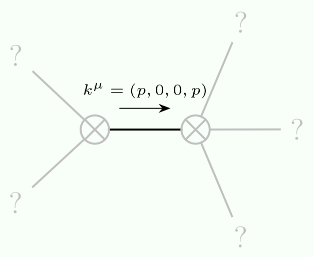
Pole residue:	$-\frac{8}{\alpha_{1}} > 0$
Square mass:	$\frac{\alpha_{1}}{8\,\alpha_{6}-8\,\alpha_{7}} > 0$
Spin:	2
Parity:	Even

Massless spectrum



Massless particle

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



Massless particle

Pole residue:	$\frac{1+18\,p^{2}}{18\,\alpha_{1}+\alpha_{2}} > 0$
Polarisations:	1

Unitarity conditions

(Demonstrably impossible)