PSALTer results panel

Wave operator and propagator

$${}^{3^-}\mathcal{A}_s^{\parallel}{}^{\dagger\alpha\beta\chi}:\quad {}^{3^-}\mathcal{A}_s^{\parallel}{}_{\alpha\beta\chi} \;\to\; -\tfrac{1}{2}a_0 k^2$$

$${}^{3^-}\mathcal{W}_s^{\parallel}{}^{\dagger\alpha\beta\chi}:\quad {}^{3^-}\mathcal{W}_s^{\parallel}{}_{\alpha\beta\chi} \;\to\; -\frac{2}{a_0}$$

$${}^{0^-}\mathcal{A}_a^{\parallel}{}^{\dagger}:\quad {}^{0^-}\mathcal{A}_a^{\parallel} \;\to\; -\frac{a_0}{2}-6c_1k^2$$

$${}^{0^-}\mathcal{W}_a^{\parallel}{}^{\dagger}:\quad {}^{0^-}\mathcal{W}_a^{\parallel} \;\to\; -\frac{2}{a_0+12c_1k^2}$$

	${}^{2^-}\mathcal{A}_s^{\parallel}{}_{\alpha\beta\chi}$	${}^{2^-}\mathcal{A}_a^{\parallel}{}_{\alpha\beta\chi}$
${}^{2^-}\mathcal{A}_a^{\parallel}{}^{\dagger\alpha\beta\chi}$	$\frac{a_0}{4}$	0
${}^{2^-}\mathcal{A}_s^{\parallel}{}^{\dagger\alpha\beta\chi}$	0	$\frac{a_0}{4}$

	${}^{2^-}\mathcal{W}_s^{\parallel}{}_{\alpha\beta\chi}$	${}^{2^-}\mathcal{W}_a^{\parallel}{}_{\alpha\beta\chi}$
${}^{2^-}\mathcal{W}_a^{\parallel}{}^{\dagger\alpha\beta\chi}$	$\frac{4}{a_0}$	0
${}^{2^-}\mathcal{W}_s^{\parallel}{}^{\dagger\alpha\beta\chi}$	0	$\frac{4}{a_0}$

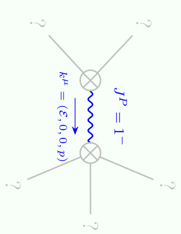
Spin-parity form	Covariant form	Multiplicities
$2k\,{}^{0^+}\mathcal{W}_s^{\perp h}+6i\,{}^{0^+}\mathcal{T}^{\perp} == k\,{}^{0^+}\mathcal{W}_s^{\parallel}$	$3\partial_\chi\partial_\beta\partial_\alpha\mathcal{W}^{\alpha\beta\chi}+\partial_\chi\partial^\chi\partial_\alpha\mathcal{W}^{\alpha\beta}{}_\beta == 2(3\partial_\beta\partial_\alpha\mathcal{T}^{\alpha\beta}+\partial_\chi\partial^\chi\partial_\beta\mathcal{W}^{\alpha}{}_{\alpha}{}^{\beta}+\partial_\chi\partial^\chi\partial_\beta\mathcal{W}^{\alpha\beta}{}_{\alpha})$	1
$k\,{}^{0^+}\mathcal{W}_s^{\perp t}+2i\,{}^{0^+}\mathcal{T}^{\perp} == 0$	$2\partial_\beta\partial_\alpha\mathcal{T}^{\alpha\beta} == \partial_\chi\partial_\beta\partial_\alpha\mathcal{W}^{\alpha\beta\chi}$	1
$6k\,{}^{1^-}\mathcal{W}_a^{\perp\alpha}+2k\,{}^{1^-}\mathcal{W}_s^{\parallel h\alpha}+k\,{}^{1^-}\mathcal{W}_s^{\perp t\alpha}+12i\,{}^{1^-}\mathcal{T}^{\perp\alpha} == k\,{}^{1^-}\mathcal{W}_s^{\parallel t\alpha}$	$12\partial_\chi\partial_\beta\partial^\alpha\mathcal{T}^{\beta\chi}+2\partial_\delta\partial^\delta\partial_\chi\partial^\alpha\mathcal{W}^{\beta}{}_{\beta}{}^{\chi}+2\partial_\delta\partial^\delta\partial_\chi\partial^\alpha\mathcal{W}^{\beta\chi}{}_{\beta}+6\partial_\delta\partial^\delta\partial_\chi\partial_\beta\mathcal{W}^{\beta\alpha\chi}+\partial_\delta\partial^\delta\partial_\chi\partial^\chi\mathcal{W}^{\alpha\beta}{}_{\beta} == 12\partial_\chi\partial^\chi\partial_\beta\mathcal{T}^{\alpha\beta}+6\partial_\delta\partial_\chi\partial_\beta\partial^\alpha\mathcal{W}^{\beta\chi\delta}+\partial_\delta\partial^\delta\partial_\beta\partial^\alpha\mathcal{W}^{\beta\chi}{}_{\chi}+2\partial_\delta\partial^\delta\partial_\chi\partial^\chi\mathcal{W}^{\beta\alpha}{}_{\beta}+2\partial_\delta\partial^\delta\partial_\chi\partial^\chi\mathcal{W}^{\beta}{}_{\beta}{}^{\alpha}$	3
$3k\,{}^{1^-}\mathcal{W}_a^{\perp\alpha}+k\,{}^{1^-}\mathcal{W}_s^{\perp t\alpha}+6i\,{}^{1^-}\mathcal{T}^{\perp\alpha} == k\,{}^{1^-}\mathcal{W}_s^{\perp h\alpha}$	$2\partial_\chi\partial_\beta\partial^\alpha\mathcal{T}^{\beta\chi}+\partial_\delta\partial^\delta\partial_\chi\partial_\beta\mathcal{W}^{\beta\alpha\chi} == 2\partial_\chi\partial^\chi\partial_\beta\mathcal{T}^{\alpha\beta}+\partial_\delta\partial_\chi\partial_\beta\partial^\alpha\mathcal{W}^{\beta\chi\delta}$	3
Total expected gauge generators:		8

$$\begin{aligned}S == &\iiiint\Big(\mathcal{A}^{\alpha\beta\chi}\,\mathcal{W}_{\alpha\beta\chi}+\mathcal{T}^{\alpha\beta}\,h_{\alpha\beta}+\tfrac{1}{36}a_0\big(8\,\mathcal{A}_{\alpha}{}^{\chi}{}_{\chi}\,\mathcal{A}^{\alpha\beta}{}_{\beta}-18\,\mathcal{A}^{\alpha\beta\chi}\,\mathcal{A}_{\beta\chi\alpha}-\\
&8\,\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}\,\mathcal{A}_{\beta}{}^{\chi}{}_{\chi}+16\,\mathcal{A}^{\alpha\beta}{}_{\alpha}\,\mathcal{A}_{\beta}{}^{\chi}{}_{\chi}+\\
&2\,\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}\,\mathcal{A}^{\chi}{}_{\beta\chi}+4\,\mathcal{A}^{\alpha\beta}{}_{\beta}\,\partial_\alpha h^{\chi}{}_{\chi}-9\,h^{\chi}{}_{\chi}\,\partial_\beta\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}+\\
&9\,h^{\chi}{}_{\chi}\,\partial_\beta\mathcal{A}^{\alpha\beta}{}_{\alpha}-18\,h_{\alpha\chi}\,\partial_\beta\mathcal{A}^{\alpha\beta\chi}-\\
&4\,\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}\,\partial_\beta h^{\chi}{}_{\chi}-16\,\mathcal{A}^{\alpha\beta}{}_{\beta}\,\partial_\chi h_{\alpha}{}^{\chi}+\\
&16\,\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}\,\partial_\chi h_{\beta}{}^{\chi}+18\,h_{\beta\chi}\,\partial^\chi\mathcal{A}^{\alpha}{}_{\alpha}{}^{\beta}\big)+\\
&c_1\big(\partial_\alpha\mathcal{A}_{\chi}{}^{\mu}{}_{\mu}\,\partial^\chi\mathcal{A}^{\alpha\beta}{}_{\beta}-\partial_\chi\mathcal{A}_{\alpha}{}^{\mu}{}_{\mu}\,\partial^\chi\mathcal{A}^{\alpha\beta}{}_{\beta}+\\
&(2\,\partial_\alpha\mathcal{A}_{\beta\chi\mu}-2\,\partial_\alpha\mathcal{A}_{\beta\mu\chi}-2\,\partial_\alpha\mathcal{A}_{\chi\beta\mu}+2\,\partial_\alpha\mathcal{A}_{\chi\mu\beta}+\\
&\partial_\alpha\mathcal{A}_{\mu\beta\chi}-\partial_\alpha\mathcal{A}_{\mu\chi\beta}-2\,\partial_\beta\mathcal{A}_{\alpha\chi\mu}+\partial_\beta\mathcal{A}_{\alpha\mu\chi}-\\
&\partial_\beta\mathcal{A}_{\chi\mu\alpha}+\partial_\chi\mathcal{A}_{\alpha\beta\mu}-\partial_\chi\mathcal{A}_{\beta\alpha\mu}+2\,\partial_\chi\mathcal{A}_{\beta\mu\alpha}-\\
&\partial_\mu\mathcal{A}_{\alpha\beta\chi}+\partial_\mu\mathcal{A}_{\alpha\chi\beta}+\partial_\mu\mathcal{A}_{\beta\alpha\chi}-2\,\partial_\mu\mathcal{A}_{\beta\chi\alpha}+\\
&\partial_\mu\mathcal{A}_{\chi\beta\alpha})\,\partial^\mu\mathcal{A}^{\alpha\beta\chi}\big)\Big)[t,x,y,z]\,dz\,dy\,dx\,dt\end{aligned}$$

Massive and massless spectra

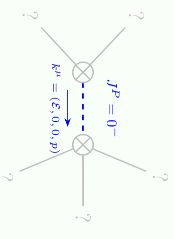
Pole residue:	Square mass:	Spin:	Parity:
$\frac{41a_0-150c_1}{8a_0c_1-24c_1^2}>0$	$-\frac{3a_0}{4c_1}>0$	1	Odd

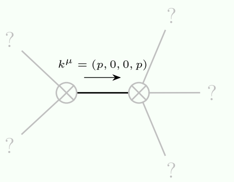
Massive particle



Pole residue:	Square mass:	Spin:	Parity:
$\frac{1}{6c_1}>0$	$-\frac{a_0}{12c_1}>0$	0	Odd

Massive particle





Massless particle

Pole residue:	$-\frac{1}{a_0}>0$
Polarisations:	2

Unitarity conditions

$a_0<0\;\&\&\;c_1>0$