PSALTer results panel

$$\mathcal{S} == \iiiint \Big(\mathcal{A}^{\alpha\beta\chi}\ \sigma_{\alpha\beta\chi} + f^{\alpha\beta}\ \tau(\Delta+\mathcal{K})_{\alpha\beta} + 2\beta_1 \big(-\mathcal{A}_{\alpha\chi\beta}\mathcal{A}^{\alpha\beta\chi} + (2\mathcal{A}_{\beta\chi\alpha} - \partial_\alpha f_{\chi\beta} + \partial_\chi f_{\alpha\beta})\partial^\chi f^{\alpha\beta} + \mathcal{A}_{\alpha\beta\chi}(\mathcal{A}^{\alpha\beta\chi} + 2\partial^\chi f^{\alpha\beta})\big) + 2\alpha_1 (-\partial_\chi \mathcal{A}_{\alpha\beta\delta} + \partial_\delta \mathcal{A}_{\alpha\beta\chi})\partial^\delta \mathcal{A}^{\alpha\beta\chi}\Big)[t,x,y,z]\,dz\,dy\,dx\,dt$$

Wave operator

	$0^+\,\mathcal{A}^{\parallel}$	$0^+\,f^{\parallel}$	$0^+\,f^{\perp}$	$0^-\,\mathcal{A}^{\parallel}$
$0^+\,\mathcal{A}^{\parallel}\,\dagger$	$\beta_1 + 2\alpha_1 k^2$	$-i\sqrt{2}\,\beta_1 k$	0	0
$0^+\,f^{\parallel}\,\dagger$	$i\sqrt{2}\,\beta_1 k$	$2\beta_1 k^2$	0	0
$0^+\,f^{\perp}\,\dagger$	0	0	0	0
$0^-\,\mathcal{A}^{\parallel}\,\dagger$	0	0	0	$4\beta_1 + 2\alpha_1 k^2$

	$1^+\,\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$1^+\,\mathcal{A}^{\perp}{}_{\alpha\beta}$	$1^+\,f^{\parallel}{}_{\alpha\beta}$	$1^-\,\mathcal{A}^{\parallel}{}_{\alpha}$	$1^-\,\mathcal{A}^{\perp}{}_{\alpha}$	$1^-\,f^{\parallel}{}_{\alpha}$	$1^-\,f^{\perp}{}_{\alpha}$
$1^+\,\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$3\beta_1 + 2\alpha_1 k^2$	$\sqrt{2}\,\beta_1$	$i\sqrt{2}\,\beta_1 k$	0	0	0	0
$1^+\,\mathcal{A}^{\perp}\,\dagger^{\alpha\beta}$	$\sqrt{2}\,\beta_1$	$2\beta_1$	$2i\beta_1 k$	0	0	0	0
$1^+\,f^{\parallel}\,\dagger^{\alpha\beta}$	$-i\sqrt{2}\,\beta_1 k$	$-2i\beta_1 k$	$2\beta_1 k^2$	0	0	0	0
$1^-\,\mathcal{A}^{\parallel}\,\dagger^{\alpha}$	0	0	0	$\beta_1 + 2\alpha_1 k^2$	0	0	0
$1^-\,\mathcal{A}^{\perp}\,\dagger^{\alpha}$	0	0	0	0	β_1	0	$i\sqrt{2}\,\beta_1 k$
$1^-\,f^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-\,f^{\perp}\,\dagger^{\alpha}$	0	0	0	0	$-i\sqrt{2}\,\beta_1 k$	0	$2\beta_1 k^2$

	$2^+\,\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$2^+\,f^{\parallel}{}_{\alpha\beta}$	$2^-\,\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$2^+\,\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$\beta_1 + 2\alpha_1 k^2$	$-i\sqrt{2}\,\beta_1 k$	0
$2^+\,f^{\parallel}\,\dagger^{\alpha\beta}$	$i\sqrt{2}\,\beta_1 k$	$2\beta_1 k^2$	0
$2^-\,\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	$\beta_1 + 2\alpha_1 k^2$

Saturated propagator

	$0^+\,\sigma^{\parallel}$	$0^+\,\tau^{\parallel}$	$0^+\,\tau^{\perp}$	$0^-\,\sigma^{\parallel}$
$0^+\,\sigma^{\parallel}\,\dagger$	$\frac{1}{2\alpha_1 k^2}$	$\frac{i}{2\sqrt{2}\,\alpha_1 k^3}$	0	0
$0^+\,\tau^{\parallel}\,\dagger$	$-\frac{i}{2\sqrt{2}\,\alpha_1 k^3}$	$\frac{\beta_1+2\alpha_1 k^2}{4\alpha_1\beta_1 k^4}$	0	0
$0^+\,\tau^{\perp}\,\dagger$	0	0	0	0
$0^-\,\sigma^{\parallel}\,\dagger$	0	0	0	$\frac{1}{4\beta_1+2\alpha_1 k^2}$

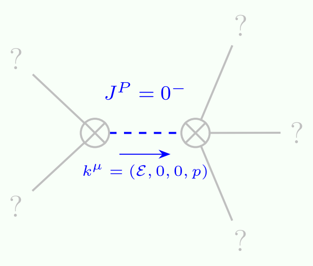
	$1^+\,\sigma^{\parallel}{}_{\alpha\beta}$	$1^+\,\sigma^{\perp}{}_{\alpha\beta}$	$1^+\,\tau^{\parallel}{}_{\alpha\beta}$	$1^-\,\sigma^{\parallel}{}_{\alpha}$	$1^-\,\sigma^{\perp}{}_{\alpha}$	$1^-\,\tau^{\parallel}{}_{\alpha}$	$1^-\,\tau^{\perp}{}_{\alpha}$
$1^+\,\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{1}{2\beta_1+2\alpha_1 k^2}$	$-\frac{1}{2\sqrt{2}\,(1+k^2)(\beta_1+\alpha_1 k^2)}$	$-\frac{i k}{2\sqrt{2}\,(1+k^2)(\beta_1+\alpha_1 k^2)}$	0	0	0	0
$1^+\,\sigma^{\perp}\,\dagger^{\alpha\beta}$	$-\frac{1}{2\sqrt{2}\,(1+k^2)(\beta_1+\alpha_1 k^2)}$	$\frac{3\beta_1+2\alpha_1 k^2}{4\beta_1(1+k^2)^2(\beta_1+\alpha_1 k^2)}$	$\frac{i k(3\beta_1+2\alpha_1 k^2)}{4\beta_1(1+k^2)^2(\beta_1+\alpha_1 k^2)}$	0	0	0	0
$1^+\,\tau^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{i k}{2\sqrt{2}\,(1+k^2)(\beta_1+\alpha_1 k^2)}$	$-\frac{i k(3\beta_1+2\alpha_1 k^2)}{4\beta_1(1+k^2)^2(\beta_1+\alpha_1 k^2)}$	$\frac{k^2(3\beta_1+2\alpha_1 k^2)}{4\beta_1(1+k^2)^2(\beta_1+\alpha_1 k^2)}$	0	0	0	0
$1^-\,\sigma^{\parallel}\,\dagger^{\alpha}$	0	0	0	$\frac{1}{\beta_1+2\alpha_1 k^2}$	0	0	0
$1^-\,\sigma^{\perp}\,\dagger^{\alpha}$	0	0	0	0	$\frac{1}{\beta_1(1+2k^2)^2}$	0	$\frac{i\sqrt{2}\,k}{\beta_1(1+2k^2)^2}$
$1^-\,\tau^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-\,\tau^{\perp}\,\dagger^{\alpha}$	0	0	0	0	$-\frac{i\sqrt{2}\,k}{\beta_1(1+2k^2)^2}$	0	$\frac{2k^2}{\beta_1(1+2k^2)^2}$

	$2^+\,\sigma^{\parallel}{}_{\alpha\beta}$	$2^+\,\tau^{\parallel}{}_{\alpha\beta}$	$2^-\,\sigma^{\parallel}{}_{\alpha\beta\chi}$
$2^+\,\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{1}{2\alpha_1 k^2}$	$\frac{i}{2\sqrt{2}\,\alpha_1 k^3}$	0
$2^+\,\tau^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{i}{2\sqrt{2}\,\alpha_1 k^3}$	$\frac{\beta_1+2\alpha_1 k^2}{4\alpha_1\beta_1 k^4}$	0
$2^-\,\sigma^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	$\frac{1}{\beta_1+2\alpha_1 k^2}$

Source constraints

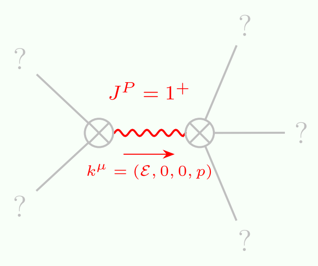
Spin-parity form	Covariant form	Multiplicities
$0^+\,\tau^{\perp} == 0$	$\partial_\beta\partial_\alpha \tau(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$1^-\,\tau^{\parallel\,\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha \tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta \tau(\Delta+\mathcal{K})^{\beta\alpha}$	3
$2ik\ 1^-\,\sigma^{\perp\,\alpha} + 1^-\,\tau^{\perp\,\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha \tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta \tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\partial_\delta\partial^\delta\partial_\chi\partial_\beta \sigma^{\beta\alpha\chi}$	3
$ik\ 1^+\,\sigma^{\perp\,\alpha\beta} + 1^+\,\tau^{\parallel\,\alpha\beta} == 0$	$\partial_\chi\partial^\alpha \tau(\Delta+\mathcal{K})^{\beta\chi} + \partial_\chi\partial^\beta \tau(\Delta+\mathcal{K})^{\chi\alpha} + \partial_\chi\partial^\chi \tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\partial_\delta\partial_\chi\partial^\alpha \sigma^{\chi\beta\delta} + 2\partial_\delta\partial^\delta\partial_\chi \sigma^{\chi\alpha\beta} == \partial_\chi\partial^\alpha \tau(\Delta+\mathcal{K})^{\chi\beta} + \partial_\chi\partial^\beta \tau(\Delta+\mathcal{K})^{\alpha\chi} + \partial_\chi\partial^\chi \tau(\Delta+\mathcal{K})^{\beta\alpha} + 2\partial_\delta\partial_\chi\partial^\beta \sigma^{\chi\alpha\delta}$	3
Total expected gauge generators:		10

Massive spectrum



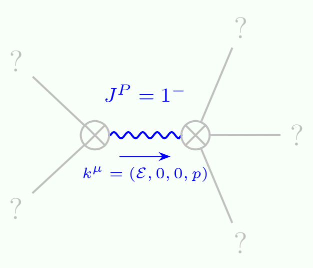
Massive particle

Pole residue:	$-\frac{1}{2\alpha_1} > 0$
Square mass:	$-\frac{2\beta_1}{\alpha_1} > 0$
Spin:	0
Parity:	Odd



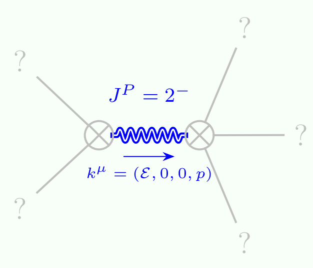
Massive particle

Pole residue:	$\frac{3\alpha_1-2\beta_1}{4\alpha_1^2-4\alpha_1\beta_1} > 0$
Square mass:	$-\frac{\beta_1}{\alpha_1} > 0$
Spin:	1
Parity:	Even



Massive particle

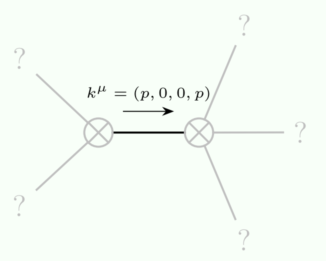
Pole residue:	$-\frac{1}{2\alpha_1} > 0$
Square mass:	$-\frac{\beta_1}{2\alpha_1} > 0$
Spin:	1
Parity:	Odd



Massive particle

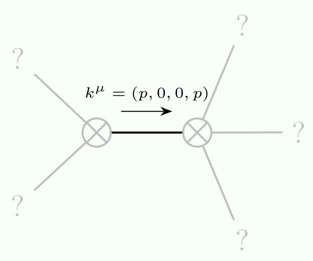
Pole residue:	$-\frac{1}{2\alpha_1} > 0$
Square mass:	$-\frac{\beta_1}{2\alpha_1} > 0$
Spin:	2
Parity:	Odd

Massless spectrum



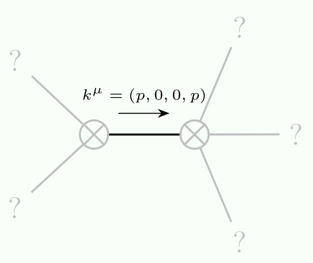
Massless particle

Pole residue:	$\frac{7}{\alpha_1} + \frac{2p^2}{\beta_1} + \frac{4\alpha_1 p^4}{\beta_1^2} > 0$
Polarisations:	2



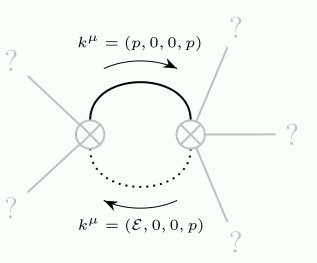
Massless particle

Pole residue:	$-\frac{1}{\alpha_1\beta_1^2}\left(\beta_1^2 + 28\alpha_1\beta_1 p^2 + 3\sqrt{\beta_1^2(9\beta_1^2 - 8\alpha_1\beta_1 p^2 + 144\alpha_1^2 p^4)}\right) > 0$
Polarisations:	3



Massless particle

Pole residue:	$\frac{1}{\alpha_1\beta_1^2}\left(-\beta_1(\beta_1 + 28\alpha_1 p^2) + 3\sqrt{\beta_1^2(9\beta_1^2 - 8\alpha_1\beta_1 p^2 + 144\alpha_1^2 p^4)}\right) > 0$
Polarisations:	3



Quartic pole

Pole residue:	$0 < \frac{p^2}{\alpha_1}\ \&\&\ \frac{p^2}{\alpha_1} > 0$
Polarisations:	3

Unitarity conditions

(Demonstrably impossible)