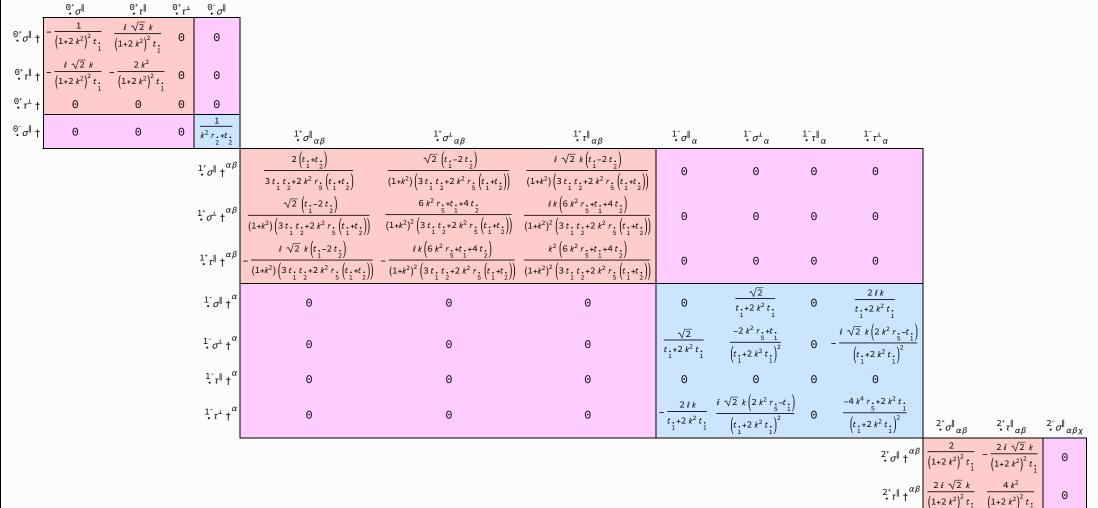
# $PSALTer \ results \ panel \\ S == \iiint \Big( \frac{1}{6} \Big( 6t_{1}^{2} \mathcal{A}^{\alpha_{1}}_{\alpha} \mathcal{A}^{\beta_{1}}_{\theta} + 6 \mathcal{A}^{\alpha\beta\chi} \mathcal{A}^{\beta_{1}}_{\alpha} \mathcal{A}^{\beta_{1}}_{\theta} + 6 \mathcal{A}^{\alpha\beta\chi} \mathcal{A}^{\beta_{1}}_{\alpha} \mathcal{A}^{\beta_{1}}_{\theta} + 6 \mathcal{A}^{\alpha\beta\chi} \mathcal{A}^{\beta_{1}}_{\alpha} \mathcal{A}^{\beta_{1}}_{\theta} \mathcal{A}^{\beta_{1}}_{\theta}$

### <u>Wave</u> <u>operator</u>

<sup>0⁺</sup> Æ <sup>∥</sup> †	-t.	$i \sqrt{2} kt$	0	0									
<sup>0,+</sup> f <sup>∥</sup> †	$-i \sqrt{2} kt$	$-2k^2t$	0	0									
<sup>⊙</sup> *f <sup>⊥</sup> †	0	Θ	0	0									
<sup>⊙-</sup> Æ <sup>∥</sup> †	0	0	0	$k^2 r \cdot + t \cdot 2$	${\stackrel{1^{+}}{\cdot}}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	${}^{1^+}_{\boldsymbol{\cdot}}\mathcal{A}^_{\alpha\beta}$	$\left. \stackrel{1^{+}}{\cdot} f \right _{\alpha\beta}$	${}^{1^{-}}_{\bullet}\mathcal{A}^{\parallel}{}_{\alpha}$	$^{1}_{\bullet}\mathcal{A}^{\perp}{}_{\alpha}$	$ f _{\alpha}$	$\int_{\bullet}^{1} f^{\perp}_{\alpha}$		
					$\frac{1}{6} \left( 6 k^2 r_{5} + t_{1} + 4 t_{2} \right)$		$-\frac{ik\left(t_{1}-2t_{2}\right)}{3\sqrt{2}}$	0	0	0	0		
				${}^{1^{\scriptscriptstyle +}}_{\: \scriptstyle \bullet} \mathcal{A}^{\scriptscriptstyle \perp}  \dagger^{lphaeta}$	3 √2	$\frac{t \cdot +t}{\frac{1}{2}}$	$\frac{1}{3} i k \left( t_{\cdot} + t_{\cdot} \right)$	0	0	0	0		
				$f^{\parallel} \uparrow^{\parallel} \uparrow^{\alpha\beta}$	$\frac{i k \left(t_{1} - 2 t_{2}\right)}{3 \sqrt{2}}$	$-\frac{1}{3} i k \left(t_{1} + t_{2}\right)$	$\frac{1}{3} k^2 \left( t_{ \cdot } + t_{ \cdot } \right)$	0	0	0	0		
				$^{1}_{\bullet}\mathcal{A}^{\parallel}\uparrow^{lpha}$	0	0	0	$k^2 r_{\cdot 5} - \frac{t_{\cdot 1}}{2}$	$\frac{t_1}{\sqrt{2}}$	0	i k t . 1		
				${}^{1^{-}}_{\bullet}\mathcal{H}^{\perp}\mathop{\dagger}^{\alpha}$	Θ	0	0	$\frac{t_1}{\sqrt{2}}$	Θ	0	0		
				$f^{-1} f^{\parallel} \uparrow^{\alpha}$	0	0	0	0	0	0	0		
				$\frac{1}{\bullet}f^{\perp}\uparrow^{\alpha}$	Θ	Θ	Θ	-i k t .	0	0	0	$ \mathcal{A}^{+}_{\boldsymbol{\alpha}\beta} _{\alpha\beta}^{2^{+}_{\boldsymbol{\beta}}f} _{\alpha\beta}^{2^{+}_{\boldsymbol{\alpha}\beta}}$	${}^{2^{-}}_{\bullet}\mathcal{A}^{\parallel}_{\alpha\beta\chi}$
											${}^{2^{+}}_{\bullet}\mathcal{A}^{\parallel}$ †	<sup>2</sup> √2	Θ
											$2^+f^{\parallel} \uparrow^{\alpha\beta}$	√2 -	0
											${}^{2^{-}}\mathcal{A}^{\parallel}$ † $^{\alpha\beta\chi}$	0 0	$\frac{t}{\frac{1}{2}}$

# Saturated propagator

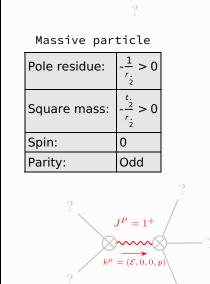


## Source constraints

Spin-parity form	Covariant form	Multiplicities	
<sup>0+</sup> τ <sup>⊥</sup> == 0	$\partial_{\beta}\partial_{\alpha\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}=0$	1	
$-2 i k \cdot 0^+ \sigma^{\parallel} + 0^+ \tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau \left(\Delta + \mathcal{K}\right)^{\alpha\beta} = \partial_{\beta}\partial^{\beta}\tau \left(\Delta + \mathcal{K}\right)^{\alpha}_{\alpha} + 2 \partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha}_{\alpha}^{\beta}$	1	
$2 i k \frac{1}{\cdot} \sigma^{\perp}^{\alpha} + \frac{1}{\cdot} \tau^{\perp}^{\alpha} = 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}_{\tau} \left(\Delta + \mathcal{K}\right)^{\beta\chi} = \partial_{\chi}\partial^{\chi}\partial_{\beta\tau} \left(\Delta + \mathcal{K}\right)^{\alpha\beta} + 2 \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	3	
1 <sub>τ</sub> τ    α == 0	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}_{\tau} \left(\Delta + \mathcal{K}\right)^{\beta\chi} = \partial_{\chi}\partial^{\chi}\partial_{\beta\tau} \left(\Delta + \mathcal{K}\right)^{\beta\alpha}$	3	
$i k \cdot 1^+ \sigma^{\perp}^{\alpha\beta} + \cdot 1^+ \tau^{\parallel}^{\alpha\beta} = 0$	$\partial_{\chi}\partial^{\alpha}\tau\left(\Delta+\mathcal{K}\right)^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau\left(\Delta+\mathcal{K}\right)^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau\left(\Delta+\mathcal{K}\right)^{\alpha\beta} + 2\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta} + 2\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} = \partial_{\chi}\partial^{\alpha}\tau\left(\Delta+\mathcal{K}\right)^{\chi\beta} + \partial_{\chi}\partial^{\beta}\tau\left(\Delta+\mathcal{K}\right)^{\alpha\chi} + \partial_{\chi}\partial^{\chi}\tau\left(\Delta+\mathcal{K}\right)^{\alpha\beta} + 2\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	3	
$-2ik \stackrel{2^+}{\cdot} \sigma^{\parallel}^{\alpha\beta} + \stackrel{2^+}{\cdot} \tau^{\parallel}^{\alpha\beta} = 0$	$-i\left(4\ \partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\delta}+2\ \partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi}_{\ \chi}-3\ \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\chi}-3\ \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial_{\chi}\partial^{\alpha}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\ \partial_{\delta}\partial^{\alpha}\partial$	5	
	$3\ \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}{}_{\tau}\ (\Delta+\mathcal{K})^{\chi\alpha} + 3\ \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}{}_{\tau}\ (\Delta+\mathcal{K})^{\alpha\beta} + 3\ \partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}{}_{\tau}\ (\Delta+\mathcal{K})^{\beta\alpha} + 4\ i\ k^{\chi}\ \partial_{\epsilon}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\sigma^{\delta}{}_{\delta}{}^{\epsilon} - 6\ i\ k^{\chi}\ \partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon} - 6\ i\ k^{\chi}\ \partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon} +$		
	$ 6 \ i \ k^{\chi} \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\alpha\beta\delta} + 6 \ i \ k^{\chi} \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\beta\alpha\delta} + 2 \ \eta^{\alpha\beta} \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi\tau} \left( \Delta + \mathcal{K} \right)^{\chi\delta} - 2 \ \eta^{\alpha\beta} \ \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta}_{\tau} \left( \Delta + \mathcal{K} \right)^{\chi}_{\chi} - 4 \ i \ \eta^{\alpha\beta} \ k^{\chi} \ \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\chi} \sigma^{\delta}_{\delta} = 0 $		
Total expected gauge generators: 16			

# <u>Massive</u> <u>spectrum</u>

 $k^{\mu} = (\mathcal{E}, 0, 0, p)$ 



Pole residue:	$\frac{-3t.t.(t.+t.)+3r.(t.^{2}+2t.^{2})}{\frac{12}{5}\frac{12}{12}\frac{12}{12}\frac{5}{12}\frac{12}{5}\frac{12}{12}} > 0$					
Square mass:	$-\frac{\frac{3t.t.}{12}}{\frac{2r.t.+2r.t.}{5i}+2r.t.} > 0$					
Spin:	1					
Parity:	Even					
Massless spectrum						

Massive particle

#### (There are no massless particles)

Gauge symmetries

#### (Not yet implemented in PSALTer)

<u>Unitarity</u> <u>conditions</u>

#### t. > 0 & -t. < t. < 0 & r. > 0 & r. < 0

# <u>Validity</u> <u>assumptions</u>

(Not yet implemented in PSALTer)