

PSALTer results panel

$$S == \iiint \int (\frac{1}{6} (6 \, \mathcal{A}^{\alpha \beta \chi} \, \sigma_{\alpha \beta \chi} + 6 \, f^{\alpha \beta} \, \tau (\Delta + \mathcal{K})_{\alpha \beta} + 8 \, r_{\frac{1}{2}} \partial_{\beta} \mathcal{A}_{\alpha i \theta} \partial^{\theta} \mathcal{A}^{\alpha \beta i} - 4 \, r_{\frac{1}{2}} \partial_{\beta} \mathcal{A}_{\alpha \theta i} \partial^{\theta} \mathcal{A}^{\alpha \beta i} + 4 \, r_{\frac{1}{2}} \partial_{\beta} \mathcal{A}_{i \theta \alpha} \partial^{\theta} \mathcal{A}^{\alpha \beta i} - 2 \, r_{\frac{1}{2}} \partial_i \mathcal{A}_{\alpha \beta \theta} \partial^{\theta} \mathcal{A}^{\alpha \beta i} + 2 \, r_{\frac{1}{2}} \partial_{\theta} \mathcal{A}_{\alpha \beta i} \partial^{\theta} \mathcal{A}^{\alpha \beta i} - 4 \, r_{\frac{1}{2}} \partial_{\theta} \mathcal{A}_{\alpha i \beta} \partial^{\theta} \mathcal{A}^{\alpha \beta i} + 4 \, t_{\frac{1}{2}} \mathcal{A}_{i \theta \alpha} \partial^{\theta} f^{\alpha i} + 2 \, t_{\frac{1}{2}} \partial_{\alpha} f_{i \theta} \partial^{\theta} f^{\alpha i} - t_{\frac{1}{2}} \partial_{\alpha} f_{\theta i} \partial^{\theta} f^{\alpha i} - t_{\frac{1}{2}} \partial_i f_{\alpha \theta} \partial^{\theta} f^{\alpha i} + t_{\frac{1}{2}} \partial_{\theta} f_{\alpha i} \partial^{\theta} f^{\alpha i} - t_{\frac{1}{2}} \partial_{\theta} f_{i \alpha} \partial^{\theta} f^{\alpha i} - 4 \, t_{\frac{1}{2}} \mathcal{A}_{\alpha \theta i} (\mathcal{A}^{\alpha i \theta} + \partial^{\theta} f^{\alpha i}) + 2 \, t_{\frac{1}{2}} \mathcal{A}_{\alpha i \theta} (\mathcal{A}^{\alpha i \theta} + 2 \partial^{\theta} f^{\alpha i})) [t, x, y, z] dz dy dx dt$$

Wave operator

$0^+ \mathcal{A}^{\parallel} \dagger$	0	0	0	0	$1^+ \mathcal{A}^{\parallel}_{\alpha\beta}$	$1^+ \mathcal{A}^{\perp}_{\alpha\beta}$	$1^+ f^{\parallel}_{\alpha\beta}$	$1^- \mathcal{A}^{\parallel}_{\alpha}$	$1^- \mathcal{A}^{\perp}_{\alpha}$	$1^- f^{\parallel}_{\alpha}$	$1^- f^{\perp}_{\alpha}$
$0^+ f^{\parallel} \dagger$	0	0	0	0							
$0^+ f^{\perp} \dagger$	0	0	0	0							
$0^- \mathcal{A}^{\parallel} \dagger$	0	0	0	$k^2 r_{\frac{1}{2}} + t_{\frac{1}{2}}$							
$1^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta}$	$\frac{2t_{\frac{1}{2}}}{3}$	$\frac{\sqrt{2}t_{\frac{1}{2}}}{3}$	$\frac{1}{3}i\sqrt{2}kt_{\frac{1}{2}}$	0	0	0	0	$2^+ \mathcal{A}^{\parallel}_{\alpha\beta}$	$2^+ f^{\parallel}_{\alpha\beta}$	$2^- \mathcal{A}^{\parallel}_{\alpha\beta\chi}$	
$1^+ \mathcal{A}^{\perp} \dagger^{\alpha\beta}$	$\frac{\sqrt{2}t_{\frac{1}{2}}}{3}$	$\frac{t_{\frac{1}{2}}}{3}$	$\frac{ikt_{\frac{1}{2}}}{3}$	0	0	0	0				
$1^+ f^{\parallel} \dagger^{\alpha\beta}$	$-\frac{1}{3}i\sqrt{2}kt_{\frac{1}{2}}$	$-\frac{1}{3}ik t_{\frac{1}{2}}$	$\frac{k^2t_{\frac{1}{2}}}{3}$	0	0	0	0				
$1^- \mathcal{A}^{\parallel} \dagger^{\alpha}$	0	0	0	0	0	0	0				
$1^- \mathcal{A}^{\perp} \dagger^{\alpha}$	0	0	0	0	0	0	0	$2^- \mathcal{A}^{\parallel} \dagger^{\alpha\beta\chi}$	0	0	
$1^- f^{\parallel} \dagger^{\alpha}$	0	0	0	0	0	0	0				
$1^- f^{\perp} \dagger^{\alpha}$	0	0	0	0	0	0	0				

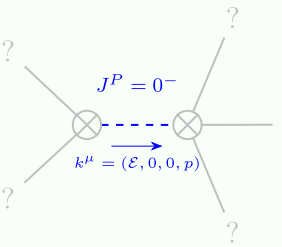
Saturated propagator

	$0^+ \sigma^{\parallel}$	$0^+ \tau^{\parallel}$	$0^+ \tau^{\perp}$	$0^- \sigma^{\parallel}$							
$0^+ \sigma^{\parallel} \dagger$	0	0	0	0							
$0^+ \tau^{\parallel} \dagger$	0	0	0	0							
$0^+ \tau^{\perp} \dagger$	0	0	0	0							
$0^- \sigma^{\parallel} \dagger$	0	0	0	$\frac{1}{k^2 r_{\frac{1}{2}} + t_{\frac{1}{2}}}$	$1^+ \sigma^{\parallel}_{\alpha\beta}$	$1^+ \sigma^{\perp}_{\alpha\beta}$	$1^+ \tau^{\parallel}_{\alpha\beta}$	$1^- \sigma^{\parallel}_{\alpha}$	$1^- \sigma^{\perp}_{\alpha}$	$1^- \tau^{\parallel}_{\alpha}$	$1^- \tau^{\perp}_{\alpha}$
	$1^+ \sigma^{\parallel} \dagger^{\alpha\beta}$	$\frac{6}{(3+k^2)^2 t_{\frac{1}{2}}}$	$\frac{3\sqrt{2}}{(3+k^2)^2 t_{\frac{1}{2}}}$	$\frac{3i\sqrt{2}k}{(3+k^2)^2 t_{\frac{1}{2}}}$	0	0	0	0			
	$1^+ \sigma^{\perp} \dagger^{\alpha\beta}$	$\frac{3\sqrt{2}}{(3+k^2)^2 t_{\frac{1}{2}}}$	$\frac{3}{(3+k^2)^2 t_{\frac{1}{2}}}$	$\frac{3ik}{(3+k^2)^2 t_{\frac{1}{2}}}$	0	0	0	0			
	$1^+ \tau^{\parallel} \dagger^{\alpha\beta}$	$-\frac{3i\sqrt{2}k}{(3+k^2)^2 t_{\frac{1}{2}}}$	$-\frac{3ik}{(3+k^2)^2 t_{\frac{1}{2}}}$	$\frac{3k^2}{(3+k^2)^2 t_{\frac{1}{2}}}$	0	0	0	0			
	$1^- \sigma^{\parallel} \dagger^{\alpha}$	0	0	0	0	0	0	0			
	$1^- \sigma^{\perp} \dagger^{\alpha}$	0	0	0	0	0	0	0			
	$1^- \tau^{\parallel} \dagger^{\alpha}$	0	0	0	0	0	0	0			
	$1^- \tau^{\perp} \dagger^{\alpha}$	0	0	0	0	0	0	0	$2^+ \sigma^{\parallel}_{\alpha\beta}$	$2^+ \tau^{\parallel}_{\alpha\beta}$	$2^- \sigma^{\parallel}_{\alpha\beta\chi}$
					$2^+ \sigma^{\parallel} \dagger^{\alpha\beta}$	0	0	0			
					$2^+ \tau^{\parallel} \dagger^{\alpha\beta}$	0	0	0			
					$2^- \sigma^{\parallel} \dagger^{\alpha\beta\chi}$	0	0	0			

Source constraints

Spin-parity form	Covariant form	Multiplicities
$0^+ \tau^{\perp} == 0$	$\partial_{\beta} \partial_{\alpha} \tau (\Delta + \mathcal{K})^{\alpha \beta} == 0$	1
$0^+ \tau^{\parallel} == 0$	$\partial_{\beta} \partial_{\alpha} \tau (\Delta + \mathcal{K})^{\alpha \beta} == \partial_{\beta} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha}_{\alpha}$	1
$0^+ \sigma^{\parallel} == 0$	$\partial_{\beta} \sigma^{\alpha}_{\alpha}{}^{\beta} == 0$	1
$1^- \tau^{\perp \alpha} == 0$	$\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\alpha \beta}$	3
$1^- \tau^{\parallel \alpha} == 0$	$\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\beta \alpha}$	3
$1^- \sigma^{\perp \alpha} == 0$	$\partial_{\chi} \partial_{\beta} \sigma^{\beta \alpha \chi} == 0$	3
$1^- \sigma^{\parallel \alpha} == 0$	$\partial_{\delta} \partial^{\alpha} \sigma^{\chi}_{\chi}{}^{\delta} + \partial_{\delta} \partial^{\delta} \sigma^{\chi \alpha}_{\chi} == \partial_{\delta} \partial_{\chi} \sigma^{\chi \alpha \delta}$	3
$i k \, 1^+ \sigma^{\parallel \alpha \beta} + 1^+ \tau^{\parallel \alpha \beta} == 0$	$\partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\chi \alpha} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\alpha \beta} + \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\chi \alpha \delta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \beta \chi} == \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi \beta} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha \chi} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\beta \alpha} + \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\chi \beta \delta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\beta \alpha \chi}$	3
$1^+ \sigma^{\parallel \alpha \beta} == 1^+ \sigma^{\alpha \beta}$	$3 \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\chi \beta \delta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\beta \alpha \chi} + 2 \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\chi \alpha \beta} == 3 \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\chi \alpha \delta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \beta \chi}$	3
$2^- \mathcal{A}^{\alpha \beta \chi} == 0$	$3 \partial_{\epsilon} \partial_{\delta} \partial^{\chi} \partial^{\alpha} \sigma^{\delta \beta \epsilon} + 3 \partial_{\epsilon} \partial^{\epsilon} \partial^{\chi} \partial^{\alpha} \sigma^{\delta \beta}_{\delta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\beta} \sigma^{\alpha \chi \delta} + 4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\beta} \sigma^{\chi \alpha \delta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\beta} \sigma^{\delta \alpha \chi} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\chi} \sigma^{\beta \alpha \delta} + 4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\chi} \sigma^{\delta \alpha \beta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \sigma^{\alpha \beta \chi} + 3 \eta^{\beta \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial^{\alpha} \sigma^{\delta}_{\delta}{}^{\epsilon} + 3 \eta^{\alpha \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\delta} \sigma^{\delta \beta \epsilon} + 3 \eta^{\beta \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial^{\delta} \sigma^{\delta \alpha}_{\delta} == 3 \partial_{\epsilon} \partial_{\delta} \partial^{\chi} \partial^{\beta} \sigma^{\delta \alpha \epsilon} + 3 \partial_{\epsilon} \partial^{\epsilon} \partial^{\chi} \partial^{\beta} \sigma^{\delta \alpha}_{\delta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\delta \chi \delta} + 4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\chi \beta \delta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\delta \beta \chi} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\chi} \sigma^{\alpha \beta \delta} + 2 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \sigma^{\beta \alpha \chi} + 4 \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \sigma^{\chi \alpha \beta} + 3 \eta^{\alpha \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial^{\beta} \sigma^{\delta}_{\delta}{}^{\epsilon} + 3 \eta^{\beta \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\delta} \sigma^{\delta \alpha \epsilon} + 3 \eta^{\alpha \chi} \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial^{\delta} \sigma^{\delta \beta}_{\delta}$	5
$2^+ \tau^{\parallel \alpha \beta} == 0$	$4 \partial_{\delta} \partial_{\chi} \partial^{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi \delta} + 2 \partial_{\delta} \partial^{\delta} \partial^{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi}_{\chi} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\alpha \beta} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\beta \alpha} + 2 \eta^{\alpha \beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \tau (\Delta + \mathcal{K})^{\chi \delta} == 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi \beta} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha \chi} + 3 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\chi \alpha} + 2 \eta^{\alpha \beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \tau (\Delta + \mathcal{K})^{\chi}_{\chi}$	5
$2^+ \sigma^{\parallel \alpha \beta} == 0$	$3 \partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\chi \beta \delta} + 3 \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\chi \alpha \delta} + 2 \eta^{\alpha \beta} \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \sigma^{\chi}_{\chi}{}^{\delta} == 2 \partial_{\delta} \partial^{\beta} \partial^{\alpha} \sigma^{\chi}_{\chi}{}^{\delta} + 3 (\partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\alpha \beta \chi} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\beta \alpha \chi})$	5
Total expected gauge generators:		36

Massive spectrum



Massive particle

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

Massless spectrum

(No particles)

Unitarity conditions

$r_{\frac{1}{2}} < 0 \& t_{\frac{1}{2}} > 0$