

PSALTer results panel

$$S = \iiint \left( \mathcal{A}^{\alpha\beta\chi} \sigma_{\alpha\beta\chi} + f^{\alpha\beta} \tau (\Delta + \mathcal{K})_{\alpha\beta} + \frac{1}{3} r_{\frac{1}{2}} (4 \partial_{\beta} \mathcal{A}_{\alpha i \theta} - 2 \partial_{\beta} \mathcal{A}_{\alpha \theta i} + 2 \partial_{\beta} \mathcal{A}_{i \theta \alpha} - \partial_i \mathcal{A}_{\alpha \beta \theta} + \partial_{\theta} \mathcal{A}_{\alpha \beta i} - 2 \partial_{\theta} \mathcal{A}_{\alpha i \beta}) \partial^{\theta} \mathcal{A}^{\alpha\beta i} - \frac{1}{2} r_{\frac{1}{3}} (\partial_{\beta} \mathcal{A}_{i \theta}^{\theta} \partial' \mathcal{A}^{\alpha\beta}_{\alpha} + \partial_i \mathcal{A}_{\beta \theta}^{\theta} \partial' \mathcal{A}^{\alpha\beta}_{\alpha} + \partial_{\alpha} \mathcal{A}^{\alpha\beta i} \partial_{\theta} \mathcal{A}_{\beta i}^{\theta} - 2 \partial' \mathcal{A}^{\alpha\beta}_{\alpha} \partial_{\theta} \mathcal{A}_{\beta i}^{\theta} + \partial_{\alpha} \mathcal{A}^{\alpha\beta i} \partial_{\theta} \mathcal{A}_{i \beta}^{\theta} - 2 \partial' \mathcal{A}^{\alpha\beta}_{\alpha} \partial_{\theta} \mathcal{A}_{i \beta}^{\theta} + 8 \partial_{\beta} \mathcal{A}_{i \theta \alpha} \partial^{\theta} \mathcal{A}^{\alpha\beta i}) + r_{\frac{1}{5}} (\partial_i \mathcal{A}_{\theta \kappa}^{\kappa} \partial^{\theta} \mathcal{A}^{\alpha i}_{\alpha} - \partial_{\theta} \mathcal{A}_{i \kappa}^{\kappa} \partial^{\theta} \mathcal{A}^{\alpha i}_{\alpha} - (\partial_{\alpha} \mathcal{A}^{\alpha i \theta} - 2 \partial^{\theta} \mathcal{A}^{\alpha i}_{\alpha}) (\partial_{\kappa} \mathcal{A}_{i \theta}^{\kappa} - \partial_{\kappa} \mathcal{A}_{\theta i}^{\kappa})) \right) [t, x, y, z] dz dy dx dt$$

Wave operator

$0^+ \mathcal{A}^{\parallel}$	$0^+ f^{\parallel}$	$0^+ f^{\perp}$	$0^- \mathcal{A}^{\parallel}$						
$0^+ \mathcal{A}^{\parallel} \dagger$	0	0	0	0					
$0^+ f^{\parallel} \dagger$	0	0	0	0					
$0^+ f^{\perp} \dagger$	0	0	0	0					
$0^- \mathcal{A}^{\parallel} \dagger$	0	0	0	$k^2 r_{\frac{1}{2}}$	$1^+ \mathcal{A}^{\parallel}_{\alpha\beta}$	$1^+ \mathcal{A}^{\perp}_{\alpha\beta}$	$1^+ f^{\parallel}_{\alpha\beta}$	$1^- \mathcal{A}^{\parallel}_{\alpha}$	$1^- \mathcal{A}^{\perp}_{\alpha}$
					$1^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta}$			$1^- \mathcal{A}^{\parallel} \dagger_{\alpha}$	$1^- \mathcal{A}^{\perp} \dagger_{\alpha}$
					$k^2 (2 r_{\frac{1}{3}} + r_{\frac{1}{5}})$	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	$\frac{1}{2} k^2 (r_{\frac{1}{3}} + 2 r_{\frac{1}{5}})$	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					$2^+ \mathcal{A}^{\parallel}_{\alpha\beta}$	$2^+ f^{\parallel}_{\alpha\beta}$	$2^- \mathcal{A}^{\parallel}_{\alpha\beta\chi}$		
					$2^+ \mathcal{A}^{\parallel} \dagger^{\alpha\beta}$	$-\frac{3 k^2 r_{\frac{1}{3}}}{2}$	0	0	0
					$2^+ f^{\parallel} \dagger^{\alpha\beta}$	0	0	0	0
					$2^- \mathcal{A}^{\parallel} \dagger^{\alpha\beta\chi}$	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	$\frac{1}{k^2 r_{\frac{1}{2}}}$	$1^+ \sigma^{\parallel}_{\alpha\beta}$	$1^+ \sigma^{\perp}_{\alpha\beta}$	$1^+ \tau^{\parallel}_{\alpha\beta}$	$1^- \sigma^{\parallel}_{\alpha}$	$1^- \sigma^{\perp}_{\alpha}$
					$1^+ \sigma^{\parallel} \dagger^{\alpha\beta}$			$1^- \sigma^{\parallel} \dagger_{\alpha}$	$1^- \tau^{\perp} \dagger_{\alpha}$
					$\frac{1}{k^2 (2 r_{\frac{1}{3}} + r_{\frac{1}{5}})}$	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	$\frac{2}{k^2 (r_{\frac{1}{3}} + 2 r_{\frac{1}{5}})}$	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					0	0	0	0	0
					$2^+ \sigma^{\parallel}_{\alpha\beta}$	$2^+ \tau^{\parallel}_{\alpha\beta}$	$2^- \sigma^{\parallel}_{\alpha\beta\chi}$		
					$2^+ \sigma^{\parallel} \dagger^{\alpha\beta}$	$-\frac{2}{3 k^2 r_{\frac{1}{3}}}$	0	0	0
					$2^+ \tau^{\parallel} \dagger^{\alpha\beta}$	0	0	0	0
					$2^- \sigma^{\parallel} \dagger^{\alpha\beta\chi}$	0	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
$1^- \tau^{\alpha} == 0$	$\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\alpha\beta}$	3
$1^- \tau^{\alpha} == 0$	$\partial_{\chi} \partial_{\beta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} == \partial_{\chi} \partial^{\chi} \partial_{\beta} \tau (\Delta + \mathcal{K})^{\beta\alpha}$	3
$1^- \sigma^{\perp\alpha} == 0$	$\partial_{\chi} \partial_{\beta} \sigma^{\beta\alpha\chi} == 0$	3
$1^+ \tau^{\parallel\alpha\beta} == 0$	$\partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta\chi} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\chi\alpha} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\alpha\beta} == \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\chi\beta} + \partial_{\chi} \partial^{\beta} \tau (\Delta + \mathcal{K})^{\alpha\chi} + \partial_{\chi} \partial^{\chi} \tau (\Delta + \mathcal{K})^{\beta\alpha}$	3
$1^+ \sigma^{\perp\alpha\beta} == 0$	$\partial_{\delta} \partial_{\chi} \partial^{\alpha} \sigma^{\chi\beta\delta} + \partial_{\delta} \partial^{\delta} \partial_{\chi} \sigma^{\chi\alpha\beta} == \partial_{\delta} \partial_{\chi} \partial^{\beta} \sigma^{\chi\alpha\delta}$	3
$2^- \sigma^{\parallel\alpha\beta\chi} == 0$	$3 \partial_{\epsilon} \partial_{\delta} \partial^{\alpha} \sigma^{\delta\beta\epsilon} + 3 \partial_{\epsilon} \partial^{\epsilon} \partial^{\alpha} \partial^{\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^{\alpha\chi\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^{\epsilon} \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^{\beta\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^{\epsilon} \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
Total expected gauge generators:		28

Massive spectrum

(No particles)

Massless spectrum

Massless particle

Pole residue:

$-\frac{2}{r_{\frac{1}{3}}} + \frac{3}{2 r_{\frac{1}{3}} + r_{\frac{1}{5}}} - \frac{16}{r_{\frac{1}{3}} + 2 r_{\frac{1}{5}}} > 0$

Polarisations:

2

Unitarity conditions

$$(r_{\frac{1}{3}} < 0 \ \&\& \ (r_{\frac{1}{5}} < -\frac{r_{\frac{1}{3}}}{2} \ || \ r_{\frac{1}{5}} > -2 r_{\frac{1}{3}})) \ || \ (r_{\frac{1}{3}} > 0 \ \&\& \ -2 r_{\frac{1}{3}} < r_{\frac{1}{5}} < -\frac{r_{\frac{1}{3}}}{2})$$