PSALTer results panel

Wave operator

	$0^+\!\mathcal{A}^{\parallel}$	$0^+\!f^{\parallel}$	$0^+\!f^{\perp}$	$0^-\!\mathcal{A}^{\parallel}$
$0^+\!\mathcal{A}^{\parallel}\dagger$	$6\,k^2\,(-r_1+r_3)$	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	0

	$1^+\!\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$1^+\!\mathcal{A}^{\perp}{}_{\alpha\beta}$	$1^+\!f^{\parallel}{}_{\alpha\beta}$	$1^-\!\mathcal{A}^{\parallel}{}_{\alpha}$	$1^-\!\mathcal{A}^{\perp}{}_{\alpha}$	$1^-\!f^{\parallel}{}_{\alpha}$	$1^-\!f^{\perp}{}_{\alpha}$
$1^+\!\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	$k^2\,(2\,r_3+r_5)$	0	0	0	0	0	0
$1^+\!\mathcal{A}^{\perp}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$1^+\!f^{\parallel}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$1^-\!\mathcal{A}^{\parallel}\dagger^{\alpha}$	0	0	0	$k^2\,(-r_1+2\,r_3+r_5)$	0	0	0
$1^-\!\mathcal{A}^{\perp}\dagger^{\alpha}$	0	0	0	0	0	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

	$2^+\!\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$2^+\!f^{\parallel}{}_{\alpha\beta}$	$2^-\!\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$2^+\!\mathcal{A}^{\parallel}\dagger^{\alpha\beta}$	0	0	0
$2^+\!f^{\parallel}\dagger^{\alpha\beta}$	0	0	0
$2^-\!\mathcal{A}^{\parallel}\dagger^{\alpha\beta\chi}$	0	0	$k^2\,r_1$

Saturated propagator

	$0^+\!\sigma^{\parallel}$	$0^+\!\tau^{\parallel}$	$0^+\!\tau^{\perp}$	$0^-\!\sigma^{\parallel}$
$0^+\!\sigma^{\parallel}\dagger$	$\frac{1}{6\,k^2\,(-r_1+r_3)}$	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	0

	$1^+\!\sigma^{\parallel}{}_{\alpha\beta}$	$1^+\!\sigma^{\perp}{}_{\alpha\beta}$	$1^+\!\tau^{\parallel}{}_{\alpha\beta}$	$1^-\!\sigma^{\parallel}{}_{\alpha}$	$1^-\!\sigma^{\perp}{}_{\alpha}$	$1^-\!\tau^{\parallel}{}_{\alpha}$	$1^-\!\tau^{\perp}{}_{\alpha}$
$1^+\!\sigma^{\parallel}\dagger^{\alpha\beta}$	$\frac{1}{k^2\,(2\,r_3+r_5)}$	0	0	0	0	0	0
$1^+\!\sigma^{\perp}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$1^+\!\tau^{\parallel}\dagger^{\alpha\beta}$	0	0	0	0	0	0	0
$1^-\!\sigma^{\parallel}\dagger^{\alpha}$	0	0	0	$\frac{1}{k^2\,(-r_1+2\,r_3+r_5)}$	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	$\frac{1}{k^2\,r_1}$

Source constraints

Spin-parity form	Covariant form	Multiplicities
$0^-\!\sigma^{\parallel} == 0$	$\epsilon\eta_{\alpha\beta\chi\delta}\,\partial^\delta\sigma^{\alpha\beta\chi} == 0$	1
$0^+\!\tau^{\perp} == 0$	$\partial_\beta\partial_\alpha\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == 0$	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
$1^-\!\tau^{\perp\,\alpha} == 0$	$\partial_\chi\partial_\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} == \partial_\chi\partial^\chi\partial_\beta\tau\,(\Delta+\mathcal{K})^{\alpha\beta}$	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
$1^+\!\tau^{\parallel\,\alpha\beta} == 0$	$\partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} + \partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + \partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\alpha\beta} == \partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi\beta} + \partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\alpha\chi} + \partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\beta\alpha}$	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
$2^+\!\tau^{\parallel\,\alpha\beta} == 0$	$4\,\partial_\delta\partial_\chi\partial^\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi\delta} + 2\,\partial_\delta\partial^\delta\partial^\beta\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi}{}_\chi + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\alpha\beta} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\chi\tau\,(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\eta^{\alpha\beta}\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial_\chi\tau\,(\Delta+\mathcal{K})^{\chi\delta} == 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\beta\chi} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\alpha\tau\,(\Delta+\mathcal{K})^{\chi\beta} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\alpha\chi} + 3\,\partial_\delta\partial^\delta\partial_\chi\partial^\beta\tau\,(\Delta+\mathcal{K})^{\chi\alpha} + 2\,\eta^{\alpha\beta}\,\partial_\epsilon\partial^\epsilon\partial_\delta\partial^\delta\tau\,(\Delta+\mathcal{K})^{\chi}{}_\chi$	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:		28

Massive spectrum

(No particles)

Massless spectrum

Massless particle

Pole residue:	$-\frac{3}{r_1} + \frac{3}{r_1-2\,r_3-r_5} + \frac{8}{2\,r_3+r_5} > 0$
Polarisations:	2

Unitarity conditions

$r_3 \in \mathbb{R} \ \&\& \ ((r_5 < -2\,r_3 \ \&\& \ 2\,r_3+r_5 < r_1 < 0) \ || \ (r_5 > -2\,r_3 \ \&\& \ (r_1 < 0 \ || \ r_1 > 2\,r_3+r_5)))$