PSALTer results panel

$$\mathcal{S} == \iiint\!\!\int \Big(\frac{1}{6}\,(-4\,t_3\,\mathcal{A}^{\alpha\imath}{}_{\alpha}\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta} + 6\,\mathcal{A}^{\alpha\beta\chi}\,\sigma_{\alpha\beta\chi} + 6\,f^{\alpha\beta}\,\tau(\Delta+\mathcal{K})_{\alpha\beta} + 8\,t_3\,\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\,\partial_{\imath}f^{\alpha\imath} - 3\,r_3\,\partial_{\beta}\mathcal{A}_{\imath}{}^{\theta}{}_{\theta}\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha} - 3\,r_3\,\partial_{\imath}\mathcal{A}_{\beta}{}^{\theta}{}_{\theta}\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha} - 8\,t_3\,\mathcal{A}_{\imath}{}^{\theta}{}_{\theta}\,\partial^{\prime}f^{\alpha}{}_{\alpha} + 4\,t_3\,\partial_{\imath}f^{\theta}{}_{\theta}\partial^{\prime}f^{\alpha}{}_{\alpha} - 3\,r_3\,\partial_{\alpha}\mathcal{A}^{\alpha\beta\prime}\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\imath} + 6\,r_3\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha}\partial_{\theta}\mathcal{A}_{\beta}{}^{\theta}{}_{\imath} - 3\,r_3\,\partial_{\alpha}\mathcal{A}^{\alpha\beta\prime}\partial_{\theta}\mathcal{A}_{\imath}{}^{\theta}{}_{\beta} + 6\,r_3\,\partial^{\prime}\mathcal{A}^{\alpha\beta}{}_{\alpha}\partial_{\theta}\mathcal{A}_{\imath}{}^{\theta}{}_{\beta} + 4\,t_3\,\partial_{\imath}f^{\alpha\imath}\partial_{\theta}f_{\alpha}{}^{\theta} - 8\,t_3\,\partial^{\prime}f^{\alpha}{}_{\alpha}\partial_{\theta}f_{\imath}{}^{\theta} + 8\,r_2\,\partial_{\beta}\mathcal{A}_{\alpha\imath\theta}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} - 4\,r_2\,\partial_{\beta}\mathcal{A}_{\alpha\theta\imath}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} + 4\,r_2\,\partial_{\beta}\mathcal{A}_{\imath\theta\alpha}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} - 24\,r_3\,\partial_{\beta}\mathcal{A}_{\imath\theta\alpha}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} - 2\,r_2\,\partial_{\imath}\mathcal{A}_{\alpha\beta\theta}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} + 2\,r_2\,\partial_{\theta}\mathcal{A}_{\alpha\beta\imath}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} - 4\,r_2\,\partial_{\theta}\mathcal{A}_{\alpha\imath\beta}\partial^{\theta}\mathcal{A}^{\alpha\beta\imath} + 6\,r_5\,\partial_{\imath}\mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\partial^{\theta}\mathcal{A}^{\alpha\imath}{}_{\alpha} - 6\,r_5\,\partial_{\theta}\mathcal{A}_{\imath}{}^{\kappa}{}_{\kappa}\partial^{\theta}\mathcal{A}^{\alpha\imath}{}_{\alpha} + 4\,t_2\,\mathcal{A}_{\imath\theta\alpha}\,\partial^{\theta}f^{\alpha\imath} + 2\,t_2\,\partial_{\alpha}f_{\imath\theta}\partial^{\theta}f^{\alpha\imath} - t_2\,\partial_{\alpha}f_{\theta\imath}\partial^{\theta}f^{\alpha\imath} - t_2\,\partial_{\imath}f_{\alpha\theta}\partial^{\theta}f^{\alpha\imath} + t_2\,\partial_{\theta}f_{\alpha\imath}\partial^{\theta}f^{\alpha\imath} - t_2\,\partial_{\theta}f_{\imath\alpha}\partial^{\theta}f^{\alpha\imath} - 4\,t_2\,\mathcal{A}_{\alpha\theta\imath}\,(\mathcal{A}^{\alpha\imath\theta} + \partial^{\theta}f^{\alpha\imath}) + 2\,t_2\,\mathcal{A}_{\alpha\imath\theta}\,(\mathcal{A}^{\alpha\imath\theta} + 2\,\partial^{\theta}f^{\alpha\imath}) - 6\,r_5\,\partial_{\alpha}\mathcal{A}^{\alpha\imath\theta}\partial_{\kappa}\mathcal{A}_{\imath}{}^{\kappa}{}_{\theta} + 12\,r_5\,\partial^{\theta}\mathcal{A}^{\alpha\imath}{}_{\alpha}\partial_{\kappa}\mathcal{A}_{\imath}{}^{\kappa}{}_{\theta} + 6\,r_5\,\partial_{\alpha}\mathcal{A}^{\alpha\imath\theta}\partial_{\kappa}\mathcal{A}_{\theta}{}^{\kappa}{}_{\imath} - 12\,r_5\,\partial^{\theta}\mathcal{A}^{\alpha\imath}{}_{\alpha}\partial_{\kappa}\mathcal{A}_{\theta}{}^{\kappa}{}_{\imath})\Big)[t, x, y, z]\,d\imath z\,d\imath y\,d\imath x\,d\imath t$$

Wave operator

	$0^+_{\cdot}\mathcal{A}^{\parallel}$	$0^+_{\cdot}f^{\parallel}$	$0^+_{\cdot}f^{\perp}$	$0^-_{\cdot}\mathcal{A}^{\parallel}$
$0^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger$	t_3	$-\imath\sqrt{2}\,k\,t_3$	0	0
$0^+_{\cdot}f^{\parallel}\,\dagger$	$\imath\sqrt{2}\,k\,t_3$	$2k^2\,t_3$	0	0
$0^+_{\cdot}f^{\perp}\,\dagger$	0	0	0	0
$0^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger$	0	0	0	$k^2\,r_2 + t_2$

	$1^+_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$1^+_{\cdot}\mathcal{A}^{\perp}{}_{\alpha\beta}$	$1^+_{\cdot}f^{\parallel}{}_{\alpha\beta}$	$1^-_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\mathcal{A}^{\perp}{}_{\alpha}$	$1^-_{\cdot}f^{\parallel}{}_{\alpha}$	$1^-_{\cdot}f^{\perp}{}_{\alpha}$
$1^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$k^2\,(2\,r_3 + r_5) + \frac{2\,t_2}{3}$	$\frac{\sqrt{2}\,t_2}{3}$	$\frac{1}{3}\,\imath\sqrt{2}\,k\,t_2$	0	0	0	0
$1^+_{\cdot}\mathcal{A}^{\perp}\,\dagger^{\alpha\beta}$	$\frac{\sqrt{2}\,t_2}{3}$	$\frac{t_2}{3}$	$\frac{\imath k\,t_2}{3}$	0	0	0	0
$1^+_{\cdot}f^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{1}{3}\,\imath\sqrt{2}\,k\,t_2$	$-\frac{1}{3}\,\imath k\,t_2$	$\frac{k^2\,t_2}{3}$	0	0	0	0
$1^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha}$	0	0	0	$k^2\,(\frac{r_3}{2} + r_5) + \frac{2\,t_3}{3}$	$-\frac{\sqrt{2}\,t_3}{3}$	0	$-\frac{2}{3}\,\imath k\,t_3$
$1^-_{\cdot}\mathcal{A}^{\perp}\,\dagger^{\alpha}$	0	0	0	$-\frac{\sqrt{2}\,t_3}{3}$	$\frac{t_3}{3}$	0	$\frac{1}{3}\,\imath\sqrt{2}\,k\,t_3$
$1^-_{\cdot}f^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_{\cdot}f^{\perp}\,\dagger^{\alpha}$	0	0	0	$\frac{2\,\imath k\,t_3}{3}$	$-\frac{1}{3}\,\imath\sqrt{2}\,k\,t_3$	0	$\frac{2\,k^2\,t_3}{3}$

	$2^+_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta}$	$2^+_{\cdot}f^{\parallel}{}_{\alpha\beta}$	$2^-_{\cdot}\mathcal{A}^{\parallel}{}_{\alpha\beta\chi}$
$2^+_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{3\,k^2\,r_3}{2}$	0	0
$2^+_{\cdot}f^{\parallel}\,\dagger^{\alpha\beta}$	0	0	0
$2^-_{\cdot}\mathcal{A}^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	0

Saturated propagator

	$0^+_{\cdot}\sigma^{\parallel}$	$0^+_{\cdot}\tau^{\parallel}$	$0^+_{\cdot}\tau^{\perp}$	$0^-_{\cdot}\sigma^{\parallel}$
$0^+_{\cdot}\sigma^{\parallel}\,\dagger$	$\frac{1}{(1+2\,k^2)^2\,t_3}$	$-\frac{\imath\sqrt{2}\,k}{(1+2\,k^2)^2\,t_3}$	0	0
$0^+_{\cdot}\tau^{\parallel}\,\dagger$	$\frac{\imath\sqrt{2}\,k}{(1+2\,k^2)^2\,t_3}$	$\frac{2\,k^2}{(1+2\,k^2)^2\,t_3}$	0	0
$0^+_{\cdot}\tau^{\perp}\,\dagger$	0	0	0	0
$0^-_{\cdot}\sigma^{\parallel}\,\dagger$	0	0	0	$\frac{1}{k^2\,r_2 + t_2}$

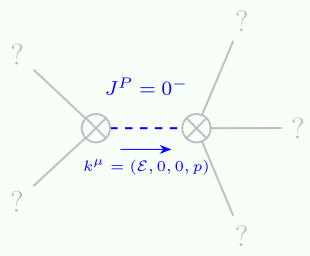
	$1^+_{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$1^+_{\cdot}\sigma^{\perp}{}_{\alpha\beta}$	$1^+_{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$1^-_{\cdot}\sigma^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\sigma^{\perp}{}_{\alpha}$	$1^-_{\cdot}\tau^{\parallel}{}_{\alpha}$	$1^-_{\cdot}\tau^{\perp}{}_{\alpha}$
$1^+_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{1}{k^2\,(2\,r_3+r_5)}$	$-\frac{\sqrt{2}}{k^2\,(1+k^2)\,(2\,r_3+r_5)}$	$-\frac{\imath\sqrt{2}}{k\,(1+k^2)\,(2\,r_3+r_5)}$	0	0	0	0
$1^+_{\cdot}\sigma^{\perp}\,\dagger^{\alpha\beta}$	$-\frac{\sqrt{2}}{k^2\,(1+k^2)\,(2\,r_3+r_5)}$	$\frac{3\,k^2\,(2\,r_3+r_5)+2\,t_2}{(k+k^3)^2\,(2\,r_3+r_5)\,t_2}$	$\frac{\imath\,(3\,k^2\,(2\,r_3+r_5)+2\,t_2)}{k\,(1+k^2)^2\,(2\,r_3+r_5)\,t_2}$	0	0	0	0
$1^+_{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	$\frac{\imath\sqrt{2}}{k\,(1+k^2)\,(2\,r_3+r_5)}$	$-\frac{\imath\,(3\,k^2\,(2\,r_3+r_5)+2\,t_2)}{k\,(1+k^2)^2\,(2\,r_3+r_5)\,t_2}$	$\frac{3\,k^2\,(2\,r_3+r_5)+2\,t_2}{(1+k^2)^2\,(2\,r_3+r_5)\,t_2}$	0	0	0	0
$1^-_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha}$	0	0	0	$\frac{2}{k^2\,(r_3+2\,r_5)}$	$\frac{2\sqrt{2}}{k^2\,(1+2\,k^2)\,(r_3+2\,r_5)}$	0	$\frac{4\,\imath}{k\,(1+2\,k^2)\,(r_3+2\,r_5)}$
$1^-_{\cdot}\sigma^{\perp}\,\dagger^{\alpha}$	0	0	0	$\frac{2\sqrt{2}}{k^2\,(1+2\,k^2)\,(r_3+2\,r_5)}$	$\frac{3\,k^2\,(r_3+2\,r_5)+4\,t_3}{(k+2\,k^3)^2\,(r_3+2\,r_5)\,t_3}$	0	$\frac{\imath\sqrt{2}\,(3\,k^2\,(r_3+2\,r_5)+4\,t_3)}{k\,(1+2\,k^2)^2\,(r_3+2\,r_5)\,t_3}$
$1^-_{\cdot}\tau^{\parallel}\,\dagger^{\alpha}$	0	0	0	0	0	0	0
$1^-_{\cdot}\tau^{\perp}\,\dagger^{\alpha}$	0	0	0	$-\frac{4\,\imath}{k\,(1+2\,k^2)\,(r_3+2\,r_5)}$	$-\frac{\imath\sqrt{2}\,(3\,k^2\,(r_3+2\,r_5)+4\,t_3)}{k\,(1+2\,k^2)^2\,(r_3+2\,r_5)\,t_3}$	0	$\frac{6\,k^2\,(r_3+2\,r_5)+8\,t_3}{(1+2\,k^2)^2\,(r_3+2\,r_5)\,t_3}$

	$2^+_{\cdot}\sigma^{\parallel}{}_{\alpha\beta}$	$2^+_{\cdot}\tau^{\parallel}{}_{\alpha\beta}$	$2^-_{\cdot}\sigma^{\parallel}{}_{\alpha\beta\chi}$
$2^+_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta}$	$-\frac{2}{3\,k^2\,r_3}$	0	0
$2^+_{\cdot}\tau^{\parallel}\,\dagger^{\alpha\beta}$	0	0	0
$2^-_{\cdot}\sigma^{\parallel}\,\dagger^{\alpha\beta\chi}$	0	0	0

Source constraints

Spin-parity form	Covariant form	Multiplicities
$0^+_{\cdot}\tau^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\tau(\Delta+\mathcal{K})^{\alpha\beta} == 0$	1
$-2\,\imath\,k\,0^+_{\cdot}\sigma^{\parallel} + 0^+_{\cdot}\tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau(\Delta+\mathcal{K})^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha}{}_{\alpha} + 2\,\partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha}{}_{\alpha}{}^{\beta}$	1
$2\,\imath\,k\;1^-_{\cdot}\sigma^{\perp}{}^{\alpha} + 1^-_{\cdot}\tau^{\perp}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	3
$1^-_{\cdot}\tau^{\parallel}{}^{\alpha} == 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} == \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau(\Delta+\mathcal{K})^{\beta\alpha}$	3
$\imath\,k\;1^+_{\cdot}\sigma^{\perp}{}^{\alpha\beta} + 1^+_{\cdot}\tau^{\parallel}{}^{\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 2\,\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta} + 2\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} == \partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta} + \partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi} + \partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	3
$2^-_{\cdot}\sigma^{\parallel}{}^{\alpha\beta\chi} == 0$	$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^{\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^{\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
$2^+_{\cdot}\tau^{\parallel}{}^{\alpha\beta} == 0$	$4\,\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\delta} + 2\,\partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha} + 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\tau(\Delta+\mathcal{K})^{\chi\delta} == 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\beta\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi} + 3\,\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha} + 2\,\eta^{\alpha\beta}\,\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}\tau(\Delta+\mathcal{K})^{\chi}{}_{\chi}$	5
Total expected gauge generators:			21

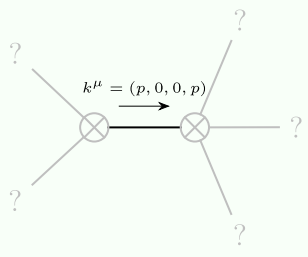
Massive spectrum



Massive particle

Pole residue:	$-\frac{1}{r_2} > 0$
Square mass:	$-\frac{t_2}{r_2} > 0$
Spin:	0
Parity:	Odd

Massless spectrum



Massless particle

Pole residue:	$-\frac{14}{r_3} + \frac{57}{2\,r_3+r_5} - \frac{216}{r_3+2\,r_5} > 0$
Polarisations:	2

Unitarity conditions

$$r_2 < 0\;\&\&\;t_2 > 0\;\&\&\;((r_3 < 0\;\&\&\;(r_5 < -\tfrac{r_3}{2}\;||\;r_5 > -2\,r_3))\;||\;(r_3 > 0\;\&\&\;-2\,r_3 < r_5 < -\tfrac{r_3}{2}))$$