

PSALTer results panel

S == \iiint\left(\frac{1}{6}t_{\dot{1}}\mathcal{A}^{\prime\prime}{}_{\alpha}\mathcal{A}_{,\theta}{}^{\theta}+6\mathcal{A}^{\alpha\beta\chi}\sigma_{\alpha\beta\chi}+6f^{\alpha\beta}{}_{\tau}(\Delta+\mathcal{K})_{\alpha\beta}-12t_{\dot{1}}\mathcal{A}_{\alpha}{}^{\theta}{}_{\theta}\partial_{\dot{1}}f^{\alpha^{\prime}}+12t_{\dot{1}}\mathcal{A}_{,\theta}{}^{\theta}\partial^{\prime}f^{\alpha}_{\alpha}-6t_{\dot{1}}\partial_{\dot{1}}f^{\theta}{}_{\theta}\partial^{\prime}f^{\alpha}_{\alpha}-6t_{\dot{1}}\partial_{\dot{1}}f^{\alpha^{\prime}}{}_{\theta}\partial_{\dot{1}}f^{\theta}_{\alpha}+12t_{\dot{1}}\partial^{\prime}f^{\alpha}_{\alpha}\partial_{\dot{1}}\partial f_{,\theta}{}^{\theta}+6r_{\dot{5}}\partial_{\dot{5}}\mathcal{A}_{\theta}{}^{\kappa}{}_{\kappa}\partial^{\theta}\mathcal{A}^{\prime\prime}{}_{\alpha}-6r_{\dot{5}}\partial_{\theta}\mathcal{A}_{,\kappa}{}^{\kappa}\partial^{\theta}\mathcal{A}^{\prime\prime}{}_{\alpha}+4t_{\dot{1}}\mathcal{A}_{,\theta\alpha}\partial^{\theta}f^{\alpha^{\prime}}+4t_{\dot{2}}\mathcal{A}_{,\theta\alpha}\partial^{\theta}f^{\alpha^{\prime}}-4t_{\dot{1}}\partial_{\alpha}f_{,\theta}{}_{\theta}\partial^{\theta}f^{\alpha^{\prime}}+2t_{\dot{2}}\partial_{\alpha}f_{,\theta}{}_{\theta}\partial^{\theta}f^{\alpha^{\prime}}-4t_{\dot{1}}\partial_{\alpha}f_{\theta,\theta}\partial^{\theta}f^{\alpha^{\prime}}-t_{\dot{2}}\partial_{\alpha}f_{\theta,\theta}\partial^{\theta}f^{\alpha^{\prime}}-t_{\dot{2}}\partial_{\dot{1}}f_{\alpha\theta}\partial^{\theta}f^{\alpha^{\prime}}-t_{\dot{2}}\partial_{\dot{1}}f_{\alpha\theta}\partial^{\theta}f^{\alpha^{\prime}}+4t_{\dot{1}}\partial_{\theta}f_{\alpha,\dot{1}}\partial^{\theta}f^{\alpha^{\prime}}+t_{\dot{2}}\partial_{\theta}f_{\alpha,\dot{1}}\partial^{\theta}f^{\alpha^{\prime}}+2t_{\dot{1}}\partial_{\theta}f_{,\alpha}{}_{\alpha}\partial^{\theta}f^{\alpha^{\prime}}-t_{\dot{2}}\partial_{\theta}f_{,\alpha}{}_{\alpha}\partial^{\theta}f^{\alpha^{\prime}}+2\left(t_{\dot{1}}+t_{\dot{2}}\right)\mathcal{A}_{\alpha,\theta}{}_{\theta}\left(\mathcal{A}^{\alpha^{\prime}\theta}+2\partial^{\theta}f^{\alpha^{\prime}}\right)+2\mathcal{A}_{\alpha\theta,\dot{1}}\left(\left(t_{\dot{1}}-2t_{\dot{2}}\right)\mathcal{A}^{\alpha^{\prime}\theta}+2\left(2t_{\dot{1}}-t_{\dot{2}}\right)\partial^{\theta}f^{\alpha^{\prime}}\right)-6r_{\dot{5}}\partial_{\alpha}\mathcal{A}^{\alpha^{\prime}\theta}{}_{\theta}\partial_{\kappa}\mathcal{A}_{,\theta}{}^{\kappa}{}_{\theta}+12r_{\dot{5}}\partial^{\theta}\mathcal{A}^{\alpha^{\prime}}{}_{\alpha}\partial_{\kappa}\mathcal{A}_{,\theta}{}^{\kappa}{}_{\theta}+6r_{\dot{5}}\partial_{\alpha}\mathcal{A}^{\alpha^{\prime}\theta}{}_{\theta}\partial_{\kappa}\mathcal{A}_{\theta,\dot{1}}{}^{\kappa}{}_{\dot{1}}-12r_{\dot{5}}\partial^{\theta}\mathcal{A}^{\alpha^{\prime}}{}_{\alpha}\partial_{\kappa}\mathcal{A}_{\theta,\dot{1}}{}^{\kappa}{}_{\dot{1}}\Big)\Big|t,x,y,z\Big|dzdydxdt

Wave operator

$\overset{\circ}{\mathcal{A}}^{\parallel}\dagger$	$\overset{\circ}{f}^{\parallel}$	$\overset{\circ}{f}^{\perp}$	$\overset{\circ}{\mathcal{A}}^{\parallel}$						
$\overset{\circ}{\mathcal{A}}^{\parallel}\dagger$	$-t_{\dot{1}}$	$i\sqrt{2}kt_{\dot{1}}$	0	0					
$\overset{\circ}{f}^{\parallel}\dagger$	$-i\sqrt{2}kt_{\dot{1}}$	$-2k^2t_{\dot{1}}$	0	0					
$\overset{\circ}{f}^{\perp}\dagger$	0	0	0	0					
$\overset{\circ}{\mathcal{A}}^{\parallel}\dagger$	0	0	0	$t_{\dot{2}}$					
	$\overset{1}{\mathcal{A}}^{\parallel}_{\alpha\beta}\dagger$	$\overset{1}{\mathcal{A}}^{\perp}_{\alpha\beta}\dagger$	$\overset{1}{f}^{\parallel}_{\alpha\beta}\dagger$	$\overset{1}{\mathcal{A}}^{\parallel}_{\alpha}\dagger$	$\overset{1}{\mathcal{A}}^{\perp}_{\alpha}\dagger$	$\overset{1}{f}^{\parallel}_{\alpha}\dagger$	$\overset{1}{f}^{\perp}_{\alpha}\dagger$		
	$\overset{1}{\mathcal{A}}^{\parallel}\dagger^{\alpha\beta}$	$\frac{1}{6}\left(6k^2r_{\dot{5}}+t_{\dot{1}}+4t_{\dot{2}}\right)$	$-\frac{t_{\dot{1}}-2t_{\dot{2}}}{3\sqrt{2}}$	$-\frac{ik\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{3\sqrt{2}}$	0	0	0	0	
	$\overset{1}{\mathcal{A}}^{\perp}\dagger^{\alpha\beta}$	$-\frac{t_{\dot{1}}-2t_{\dot{2}}}{3\sqrt{2}}$	$\frac{t_{\dot{1}}+t_{\dot{2}}}{3}$	$\frac{1}{3}ik\left(t_{\dot{1}}+t_{\dot{2}}\right)$	0	0	0	0	
	$\overset{1}{f}^{\parallel}\dagger^{\alpha\beta}$	$\frac{ik\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{3\sqrt{2}}$	$-\frac{1}{3}ik\left(t_{\dot{1}}+t_{\dot{2}}\right)$	$\frac{1}{3}k^2\left(t_{\dot{1}}+t_{\dot{2}}\right)$	0	0	0	0	
	$\overset{1}{\mathcal{A}}^{\parallel}\dagger^{\alpha}$	0	0	0	$k^2r_{\dot{5}}-\frac{t_{\dot{1}}}{2}$	$\frac{t_{\dot{1}}}{\sqrt{2}}$	0	$ikt_{\dot{1}}$	
	$\overset{1}{\mathcal{A}}^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{t_{\dot{1}}}{\sqrt{2}}$	0	0	0	
	$\overset{1}{f}^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0	
	$\overset{1}{f}^{\perp}\dagger^{\alpha}$	0	0	0	$-ikt_{\dot{1}}$	0	0	0	$\overset{2}{\mathcal{A}}^{\parallel}_{\alpha\beta}\dagger$
									$\overset{2}{f}^{\parallel}_{\alpha\beta}\dagger$
									$\overset{2}{\mathcal{A}}^{\parallel}_{\alpha\beta\chi}\dagger$
									$\overset{2}{\mathcal{A}}^{\parallel}\dagger^{\alpha\beta}$
									$\overset{2}{f}^{\parallel}\dagger^{\alpha\beta}$
									$\overset{2}{\mathcal{A}}^{\parallel}\dagger^{\alpha\beta\chi}$
									$\frac{t_{\dot{1}}}{2}$

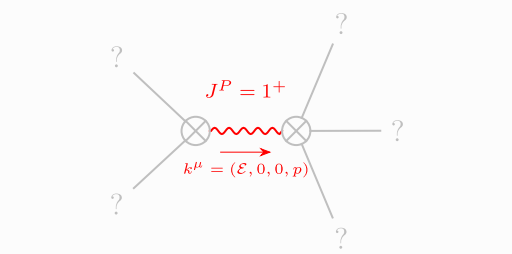
Saturated propagator

$\overset{\circ}{\sigma}^{\parallel}\dagger$	$\overset{\circ}{f}^{\parallel}$	$\overset{\circ}{f}^{\perp}$	$\overset{\circ}{\sigma}^{\parallel}$						
$\overset{\circ}{\sigma}^{\parallel}\dagger$	$-\frac{1}{\left(1+2k^2\right)^2t_{\dot{1}}}$	$\frac{i\sqrt{2}k}{\left(1+2k^2\right)^2t_{\dot{1}}}$	0	0					
$\overset{\circ}{f}^{\parallel}\dagger$	$-\frac{i\sqrt{2}k}{\left(1+2k^2\right)^2t_{\dot{1}}}$	$-\frac{2k^2}{\left(1+2k^2\right)^2t_{\dot{1}}}$	0	0					
$\overset{\circ}{f}^{\perp}\dagger$	0	0	0	0					
$\overset{\circ}{\sigma}^{\parallel}\dagger$	0	0	0	$\frac{1}{t_{\dot{2}}}$					
	$\overset{1}{\sigma}^{\parallel}_{\alpha\beta}\dagger$	$\overset{1}{\sigma}^{\perp}_{\alpha\beta}\dagger$	$\overset{1}{f}^{\parallel}_{\alpha\beta}\dagger$	$\overset{1}{\sigma}^{\parallel}_{\alpha}\dagger$	$\overset{1}{\sigma}^{\perp}_{\alpha}\dagger$	$\overset{1}{f}^{\parallel}_{\alpha}\dagger$	$\overset{1}{f}^{\perp}_{\alpha}\dagger$		
	$\overset{1}{\sigma}^{\parallel}\dagger^{\alpha\beta}$	$\frac{2\left(t_{\dot{1}}+t_{\dot{2}}\right)}{3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)}$	$\frac{\sqrt{2}\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{\left(1+k^2\right)\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	$\frac{i\sqrt{2}k\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{\left(1+k^2\right)\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	0	0	0	0	
	$\overset{1}{\sigma}^{\perp}\dagger^{\alpha\beta}$	$\frac{\sqrt{2}\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{\left(1+k^2\right)\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	$\frac{6k^2r_{\dot{5}}+t_{\dot{1}}+4t_{\dot{2}}}{\left(1+k^2\right)^2\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	$\frac{ik\left(6k^2r_{\dot{5}}+t_{\dot{1}}+4t_{\dot{2}}\right)}{\left(1+k^2\right)^2\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	0	0	0	0	
	$\overset{1}{f}^{\parallel}\dagger^{\alpha\beta}$	$\frac{i\sqrt{2}k\left(t_{\dot{1}}-2t_{\dot{2}}\right)}{\left(1+k^2\right)\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	$-\frac{ik\left(6k^2r_{\dot{5}}+t_{\dot{1}}+4t_{\dot{2}}\right)}{\left(1+k^2\right)^2\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	$\frac{k^2\left(6k^2r_{\dot{5}}+t_{\dot{1}}+4t_{\dot{2}}\right)}{\left(1+k^2\right)^2\left(3t_{\dot{1}}t_{\dot{2}}+2k^2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}$	0	0	0	0	
	$\overset{1}{\sigma}^{\parallel}\dagger^{\alpha}$	0	0	0	0	$\frac{\sqrt{2}}{t_{\dot{1}}+2k^2t_{\dot{1}}}$	0	$\frac{2ik}{t_{\dot{1}}+2k^2t_{\dot{1}}}$	
	$\overset{1}{\sigma}^{\perp}\dagger^{\alpha}$	0	0	0	$\frac{\sqrt{2}}{t_{\dot{1}}+2k^2t_{\dot{1}}}$	$\frac{-2k^2r_{\dot{5}}+t_{\dot{1}}}{\left(t_{\dot{1}}+2k^2t_{\dot{1}}\right)^2}$	0	$-\frac{i\sqrt{2}k\left(2k^2r_{\dot{5}}-t_{\dot{1}}\right)}{\left(t_{\dot{1}}+2k^2t_{\dot{1}}\right)^2}$	
	$\overset{1}{f}^{\parallel}\dagger^{\alpha}$	0	0	0	0	0	0	0	
	$\overset{1}{f}^{\perp}\dagger^{\alpha}$	0	0	0	$-\frac{2ik}{t_{\dot{1}}+2k^2t_{\dot{1}}}$	$\frac{i\sqrt{2}k\left(2k^2r_{\dot{5}}-t_{\dot{1}}\right)}{\left(t_{\dot{1}}+2k^2t_{\dot{1}}\right)^2}$	0	$\frac{-4k^4r_{\dot{5}}+2k^2t_{\dot{1}}}{\left(t_{\dot{1}}+2k^2t_{\dot{1}}\right)^2}$	$\overset{2}{\sigma}^{\parallel}_{\alpha\beta}\dagger$
									$\overset{2}{f}^{\parallel}_{\alpha\beta}\dagger$
									$\overset{2}{\sigma}^{\parallel}_{\alpha\beta\chi}\dagger$
									$\frac{2}{t_{\dot{1}}}$

Source constraints

Spin-parity form	Covariant form	Multiplicities
$\overset{\circ}{f}^{\perp}==0$	$\partial_{\beta}\partial_{\alpha\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}==0$	1
$-2ik\overset{1}{\sigma}^{\parallel}+\overset{\circ}{f}^{\perp}\dagger^{\parallel}==0$	$\partial_{\beta}\partial_{\alpha\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}==\partial_{\beta}\partial^{\beta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\alpha}_{\alpha}+2\partial_{\chi}\partial^{\chi}\partial_{\beta}\sigma^{\alpha}_{\alpha}{}^{\beta}$	1
$2ik\overset{1}{\sigma}^{\perp\alpha}+\overset{1}{f}^{\perp}\dagger^{\alpha}==0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\chi}==\partial_{\chi}\partial^{\chi}\partial_{\beta\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}+2\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}$	3
$\overset{1}{f}^{\perp}\dagger^{\alpha}==0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\chi}==\partial_{\chi}\partial^{\chi}\partial_{\beta\tau}\left(\Delta+\mathcal{K}\right)^{\beta\alpha}$	3
$ik\overset{1}{\sigma}^{\perp\alpha\beta}+\overset{1}{f}^{\perp}\dagger^{\alpha\beta}==0$	$\partial_{\chi}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\chi}+\partial_{\chi}\partial^{\beta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\alpha}+\partial_{\chi}\partial^{\chi}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}+2\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta}+2\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta}==\partial_{\chi}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}+\partial_{\chi}\partial^{\beta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\chi}+\partial_{\chi}\partial^{\chi}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\alpha}+2\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	3
$-2ik\overset{2}{\sigma}^{\parallel\alpha\beta}+\overset{2}{f}^{\perp}\dagger^{\alpha\beta}==0$	$-i\left(4\partial_{\delta}\partial_{\chi}\partial^{\beta}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\delta}+2\partial_{\delta}\partial^{\delta}\partial^{\beta}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi}_{\chi}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\chi}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\beta}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\chi}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi\alpha}+3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\alpha\beta}+3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\beta\alpha}+4ik^{\chi}\partial_{\epsilon}\partial_{\delta}\partial^{\beta}\partial^{\alpha}\sigma^{\delta}_{\delta}{}^{\epsilon}-6ik^{\chi}\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon}-6ik^{\chi}\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon}+6ik^{\chi}\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\sigma^{\alpha\beta\delta}+6ik^{\chi}\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\sigma^{\beta\alpha\delta}+2\eta^{\alpha\beta}\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi\tau}\left(\Delta+\mathcal{K}\right)^{\chi\delta}-2\eta^{\alpha\beta}\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial^{\delta}{}_{\tau}\left(\Delta+\mathcal{K}\right)^{\chi}_{\chi}-4i\eta^{\alpha\beta}k^{\chi}\partial_{\phi}\partial^{\phi}\partial_{\epsilon}\partial_{\chi}\sigma^{\delta}_{\delta}{}^{\epsilon}\right)==0$	5
Total expected gauge generators:		16

Massive spectrum



Massive particle	
Pole residue:	$-\frac{-3t_{\dot{1}}t_{\dot{2}}\left(t_{\dot{1}}+t_{\dot{2}}\right)+3r_{\dot{5}}\left(t_{\dot{1}}^2+2t_{\dot{2}}^2\right)}{r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\left(-3t_{\dot{1}}t_{\dot{2}}+2r_{\dot{5}}\left(t_{\dot{1}}+t_{\dot{2}}\right)\right)}>0$
Square mass:	$-\frac{3t_{\dot{1}}t_{\dot{2}}}{2r_{\dot{5}}t_{\dot{1}}+2r_{\dot{5}}t_{\dot{2}}}>0$
Spin:	1
Parity:	Even

Massless spectrum

(There are no massless particles)

Gauge symmetries

(Not yet implemented in PSALTer)

Unitarity conditions

(t_{\dot{1}}<0&&((t_{\dot{2}}<0&&r_{\dot{5}}>0))\parallel(t_{\dot{2}}>-t_{\dot{1}}&&r_{\dot{5}}>0)))\parallel(t_{\dot{1}}>0&&-t_{\dot{1}}<t_{\dot{2}}<0&&r_{\dot{5}}>0)

Validity assumptions

(Not yet implemented in PSALTer)