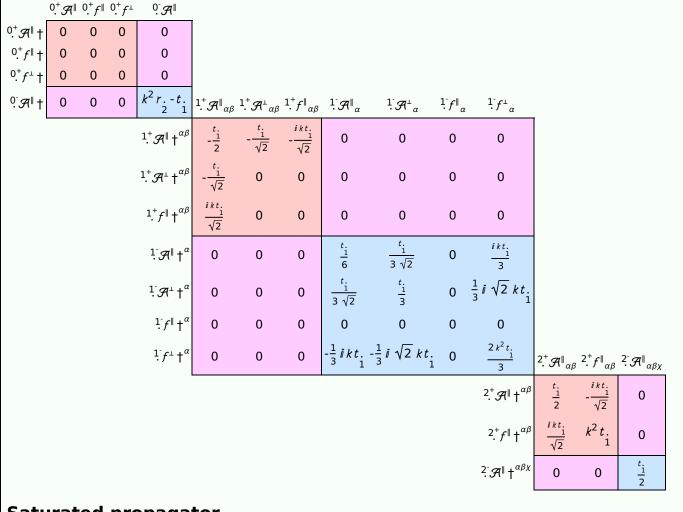
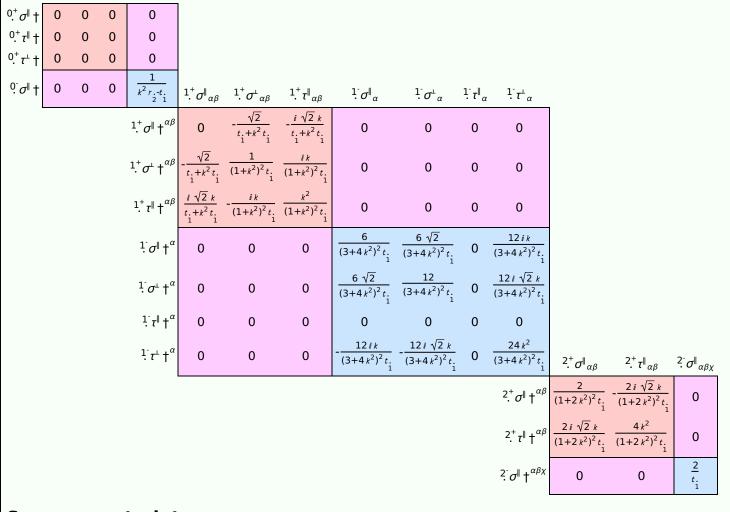
# PSALTer results panel $S = \iiint (\frac{1}{6} (2t_{1} \mathcal{A}^{\alpha_{i}}_{\alpha} \mathcal{A}^{\theta}_{i} + 6 \mathcal{A}^{\alpha\beta\chi}_{\alpha} \sigma_{\alpha\beta\chi} + 6 f^{\alpha\beta} \tau (\Delta + \mathcal{K})_{\alpha\beta} - 4t_{1} \mathcal{A}^{\theta}_{\alpha} \partial_{i} f^{\alpha i} + 4t_{1} \mathcal{A}^{\theta}_{i} \partial_{i} f^{\alpha}_{\alpha} - 2t_{1} \partial_{i} f^{\theta}_{\theta} \partial_{i} f^{\alpha}_{\alpha} - 2t_{1} \partial_{i} f^{\alpha i} \partial_{\theta} f^{\beta}_{\alpha} + 4t_{1} \partial_{i} f^{\alpha}_{\alpha} \partial_{\theta} f^{\theta}_{i} + 8r_{2} \partial_{\beta} \mathcal{A}_{\alpha i \theta} \partial_{\theta} \mathcal{A}^{\alpha\beta i} - 4r_{2} \partial_{\beta} \mathcal{A}_{\alpha \theta i} \partial_{\theta} \mathcal{A}^{\alpha\beta i} + 4r_{2} \partial_{\beta} \mathcal{A}_{\alpha \theta i} \partial_{\theta} \mathcal{A}^{\alpha\beta i} - 2r_{2} \partial_{i} \mathcal{A}_{\alpha \beta \theta} \partial_{\theta} \mathcal{A}^{\alpha\beta i} + 2r_{2} \partial_{\theta} \mathcal{A}_{\alpha \beta i} \partial_{\theta} \mathcal{A}^{\alpha\beta i} - 4r_{2} \partial_{\theta} \mathcal{A}_{\alpha i \beta} \partial_{\theta} \mathcal{A}^{\alpha\beta i} - 6t_{1} \partial_{\alpha} f_{i \theta} \partial_{\theta} f^{\alpha i} - 4r_{2} \partial_{\alpha} f^{\alpha\beta i} \partial_{\alpha} f^{\alpha\beta i} - 6t_{2} \partial_{\alpha} f^{\alpha\beta i} \partial_{\alpha} f^{\alpha\beta i} - 4r_{2} \partial_{\alpha} f^{\alpha\beta i} \partial_{\alpha} f^{\alpha\beta i} \partial_{\alpha} f^{\alpha\beta i} - 4r_{2} \partial_{\alpha} f^{\alpha\beta i} \partial_{\alpha$

 $3t. \, \partial_{\alpha}f_{\theta_{i}} \, \partial^{\theta}f^{\alpha_{i}} + 3t. \, \partial_{i}f_{\alpha\theta} \, \partial^{\theta}f^{\alpha_{i}} + 3t. \, \partial_{\theta}f_{\alpha_{i}} \, \partial^{\theta}f^{\alpha_{i}} + 3t. \, \partial_{\theta}f_{\alpha_{i}} \, \partial^{\theta}f^{\alpha_{i}} + 3t. \, \partial_{\theta}f_{\alpha_{i}} \, \partial^{\theta}f^{\alpha_{i}} + 6t. \, \mathcal{A}_{\alpha\theta_{i}} \, (\mathcal{A}^{\alpha_{i}\theta} + 2\, \partial^{\theta}f^{\alpha_{i}})))[t, \, x, \, y, \, z] \, dz \, dy \, dx \, dt$ 

## Wave operator



# Saturated propagator



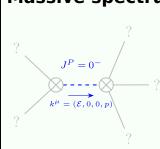
#### Source constraints

Spin-parity form	Covariant form	Multiplicities
$0.^{+} \tau^{\perp} == 0$	$\partial_{\beta}\partial_{\alpha}\tau \left(\Delta + \mathcal{K}\right)^{\alpha\beta} == 0$	1
$0^+$ $\tau^{\parallel} == 0$	$\partial_{\beta}\partial_{\alpha}\tau \left(\Delta + \mathcal{K}\right)^{\alpha\beta} == \partial_{\beta}\partial^{\beta}\tau \left(\Delta + \mathcal{K}\right)^{\alpha}_{\alpha}$	1
$0^+ \sigma^{\parallel} == 0$	$\partial_{\beta}\sigma_{\alpha}^{\alpha\beta} = 0$	1
$\frac{1}{2ik \cdot 1 \cdot \sigma^{\parallel^{\alpha}} + 1 \cdot \tau^{\perp^{\alpha}} == 0}$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau\left(\Delta+\mathcal{K}\right)^{\beta\chi}+2\left(\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\beta}_{\ \beta}^{\ \chi}-\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial_{\beta}\sigma^{\beta\alpha\chi}+\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\sigma^{\beta\alpha}_{\ \beta}\right)==\partial_{\chi}\partial^{\chi}\partial_{\beta}\tau\left(\Delta+\mathcal{K}\right)^{\alpha\beta}$	3
$1.\tau^{\alpha} = 0$	$\partial_{\chi}\partial_{\beta}\partial^{\alpha}\tau \left(\Delta + \mathcal{K}\right)^{\beta\chi} = \partial_{\chi}\partial^{\chi}\partial_{\beta}\tau \left(\Delta + \mathcal{K}\right)^{\beta\alpha}$	3
$\frac{1}{1}\sigma^{\parallel^{\alpha}} = 1 \sigma^{\perp^{\alpha}}$	$\partial_{\chi}\partial^{\alpha}\sigma^{\beta}_{\ \beta}^{\ \chi} + \partial_{\chi}\partial^{\chi}\sigma^{\beta\alpha}_{\ \beta} = 0$	3
$i k 1^+_{\cdot} \sigma^{\perp}^{\alpha\beta} + 1^+_{\cdot} \tau^{\parallel}^{\alpha\beta} == 0$	$\partial_{\chi}\partial^{\alpha}\tau\left(\Delta+\mathcal{K}\right)^{\beta\chi} + \partial_{\chi}\partial^{\beta}\tau\left(\Delta+\mathcal{K}\right)^{\chi\alpha} + \partial_{\chi}\partial^{\chi}\tau\left(\Delta+\mathcal{K}\right)^{\alpha\beta} + 2\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\chi\beta\delta} + 2\partial_{\delta}\partial^{\delta}\partial_{\chi}\sigma^{\chi\alpha\beta} = =$	3
	$\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta} + \partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi} + \partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\beta\alpha} + 2\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\chi\alpha\delta}$	
$-2 i k \stackrel{2^{+}}{\cdot} \sigma^{\parallel}{}^{\alpha\beta} + \stackrel{2^{+}}{\cdot} \tau^{\parallel}{}^{\alpha\beta} == 0  -i (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^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 5 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 5 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial_{\chi} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\beta \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\delta} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} \partial^{\alpha} \partial^{\alpha} \tau (\Delta + \mathcal{K})^{\gamma \chi} - 6 \partial_{\delta} \partial^{\alpha} $		
	$3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\alpha}\tau(\Delta+\mathcal{K})^{\chi\beta}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\alpha\chi}-3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\beta}\tau(\Delta+\mathcal{K})^{\chi\alpha}+3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau(\Delta+\mathcal{K})^{\alpha\beta}+$	
	$3\partial_{\delta}\partial^{\delta}\partial_{\chi}\partial^{\chi}\tau\left(\Delta+\mathcal{K}\right)^{\beta\alpha}+4ik^{\chi}\partial_{\epsilon}\partial_{\chi}\partial^{\beta}\partial^{\alpha}\sigma^{\delta\epsilon}_{\ \ \delta}-6ik^{\chi}\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\alpha}\sigma^{\delta\beta\epsilon}-6ik^{\chi}\partial_{\epsilon}\partial_{\delta}\partial_{\chi}\partial^{\beta}\sigma^{\delta\alpha\epsilon}+6ik^{\chi}\partial_{\epsilon}\partial^{\epsilon}\partial_{\delta}\partial_{\chi}\sigma^{\alpha\beta\delta}+$	
	$6  i  k^{\chi}  \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \sigma^{\beta \alpha \delta} + 2  \eta^{\alpha \beta}  \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial_{\chi} \tau  (\Delta + \mathcal{K})^{\chi \delta} - 2  \eta^{\alpha \beta}  \partial_{\epsilon} \partial^{\epsilon} \partial_{\delta} \partial^{\delta} \tau  (\Delta + \mathcal{K})^{\chi}_{\chi} - 4  i  \eta^{\alpha \beta}  k^{\chi}  \partial_{\phi} \partial^{\phi} \partial_{\epsilon} \partial_{\chi} \sigma^{\delta}_{\delta}{}^{\epsilon}) = 0$	

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# **Massive spectrum**

Total expected gauge generators:



## Massive particle

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

## Massless spectrum

(No particles)

#### **Unitarity conditions**

r. < 0 && t. < 0