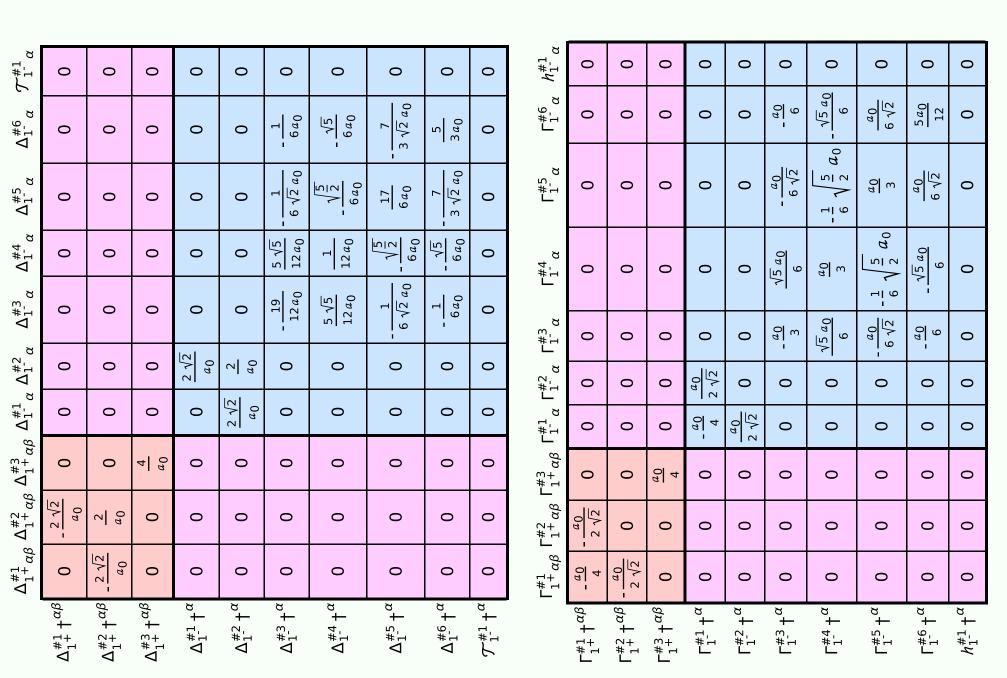
## Particle spectrograph

## Wave operator and propagator



Quadratic (free) action $S = \sum_{S=0}^{\infty} \int_{\alpha\beta} \int_$
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$2 a_0 \partial_{eta} h_{lpha \chi} \partial^\chi h^{lpha eta} + 3 a_0 \partial_\chi h_{lpha eta} \partial^\chi h^{lpha eta} + $ $4 a_0 h_{eta \chi} \partial^\chi \Gamma^lpha_lpha) [t, x, y, z] d z d y d x d t$	ints	Fundamental fields   Multiplicities	$\partial_{\beta}\partial_{\alpha}\mathcal{T}^{\alpha\beta} == 0$ 1	$\Delta_{0+}^{\#2} == 0 \qquad \qquad  \partial_{\alpha} \Delta^{\alpha \beta}  = 0 \qquad \qquad  1 $	$\partial_{X}\partial_{\beta}\partial^{\alpha}\mathcal{T}^{\beta X} == \partial_{X}\partial^{X}\partial_{\beta}\mathcal{T}^{\alpha\beta}$ 3	$2 \Delta_1^{\#6} \alpha + \Delta_1^{\#4} \alpha + 2 \Delta_1^{\#5} \alpha + \Delta_1^{\#3} \alpha == 0 \left  \partial_{\beta} \partial^{\alpha} \Delta^{\beta \chi} \right  = \partial_{\chi} \partial^{\chi} \Delta^{\alpha \beta} $ 3
	Source constraints	SO(3) irreps	$T_0^{\#2} == 0$	$\Delta_{0+}^{#3} + 2 \Delta_{0+}^{#4} + 3 \Delta_{0+}^{#2} == 0$	$\mathcal{T}_{1}^{\#1\alpha} == 0$	$2 \Delta_{1}^{\#6\alpha} + \Delta_{1}^{\#4\alpha} + 2 \Delta_{1}^{\#5}$

		$\Delta_{3}^{#}$				
	$\Delta_{0}^{\#1}$	0	0	0	0	
	$\mathcal{T}_{0}^{\#2}$	0	0	0	0	
rs:	$\mathcal{T}_{0}^{\#1}$	0	0	0	0	,
Jenerato	$\Delta_{0}^{\#4}$	0	$-\frac{1}{2\sqrt{2}}a_0$	$-\frac{1}{2\sqrt{2}a_0}$	$\frac{1}{2a_0}$	
Total constraints/gauge generators:	$\Delta_{0}^{\#3}$	0	$\frac{5}{4 a_0}$	$-\frac{3}{4 a_0}$	$-\frac{1}{2\sqrt{2}a_0}$	
	$\Delta_{0}^{\#2}$	0	$-\frac{3}{4 a_0}$	$\frac{5}{4 a_0}$	$-\frac{1}{2\sqrt{2}a_0}$	
l cor	$\Delta_0^{\#1}$	$-\frac{2}{a_0}$	0	0	0	
Tota		$\Delta_{0}^{\#1}$ †	$\Delta_{0}^{#2}$ †	$\Delta_{0}^{#3}$ †	$\Delta_{0}^{\#4}$ †	

0	0	0	0	0	$-\frac{2}{a_0}$	$\Delta_{2^{-}}^{\#2} \alpha \beta_{j}$	0	0	0	0	0	4
0	0	0	0	0	0	$_{lphaeta\chi}$ $\Delta$						
0	0	0	$\frac{4}{a_0 k^2}$	0	0	$\Delta_{2^{-}}^{\#1}_{\alpha_{i}}$	0	0	0	0	$\frac{4}{a_0}$	0
$\frac{1}{2\sqrt{2}a_0}$	$\frac{1}{2\sqrt{2}a_0}$	$\frac{1}{2a_0}$	0	0	0	${\mathcal T}_{2}^{\#1}_{\alpha\beta}$	0	0	0	$-\frac{8}{a_0 k^2}$	0	0
$\frac{5}{4a_0}$	440	$\frac{1}{2\sqrt{2}a_0}$	0	0	0	$\Delta_2^{\#3}$	0	0	$\frac{4}{a_0}$	0	0	0
1.0		- a <sub>0</sub>				$\Delta_2^{\#_2^2}\alpha\beta$	0	$-\frac{2}{a_0}$	0	0	0	O
$-\frac{3}{4a_0}$	4 a 0	$-\frac{1}{2\sqrt{2}}$	0	0	0	$\Delta_{2^{+}\alpha\beta}^{\#1}$	$\frac{4}{a_0}$	0	0	0	0	0
0	0	0	0	0	0	◁∣	$+^{\alpha\beta}$	$+^{\alpha\beta}$	$+^{\alpha\beta}$	$+^{\alpha\beta}$	$\beta \chi$	$\beta \chi$
$\Delta_{0}^{#2} +$	$\Delta_{0}^{#3} +$	$\Delta_{0}^{#4}$ †	$\mathcal{T}_{0}^{\#1}$ †	$\tau_{0}^{\#2}$ †	$\Delta_{0^{\bar{-}}}^{\#1}\dagger$		$\Delta_{2}^{#1} + 0$	$\Delta_2^{#2} + 6$	$\Delta_2^{#3} + 0$	$\mathcal{T}_{2}^{\#1} + $	$\Delta_{2^{\text{-}}}^{\#1} +^{\alpha\beta\chi}$	$\Lambda_{\tilde{\alpha}}^{#2} + \alpha \beta \chi$

Γ#1 - α0 - 2	0	0 0	0	0	0	
+ 0++ 1+	•	L + + + + + + + + + + + + + + + + + + +	$h_{0}^{#1} + h_{0}^{#}$	h#2 +	$\Gamma_{0}^{*1}$ $+$	
	$\Gamma_{2}^{\#1}_{\alpha\beta}$	$\Gamma_{2}^{\#2}$ $\alpha\beta$	$\Gamma_{2}^{\#3}_{\alpha\beta}$	$h_{2}^{\#1}_{\alpha\beta}$	$\Gamma_{2}^{\#1}_{\alpha\beta\chi}$	$\Gamma_2^{\#2}_{\alpha\beta\chi}$
$\Gamma_{2}^{#1} \dagger^{\alpha\beta}$	<u>a<sub>0</sub></u> 4	0	0	0	0	0
$\Gamma_{2}^{\#2} \dagger^{\alpha\beta}$	0	$-\frac{a_0}{2}$	0	0	0	0
$\Gamma_{2}^{#3} \dagger^{\alpha\beta}$	0	0	<u>a<sub>0</sub></u> 4	0	0	0
$h_{2}^{\#1} \dagger^{\alpha\beta}$	0	0	0	$-\frac{a_0 k^2}{8}$	0	0
$\Gamma_2^{\#1} \dagger^{\alpha\beta\chi}$	0	0	0	0	$\frac{a_0}{4}$	0
$\Gamma_2^{\#2} \dagger^{\alpha\beta\chi}$	0	0	0	0	0	<u>a<sub>0</sub></u> 4

 $\begin{array}{c} a_0 k^2 \\ 4 \\ 0 \\ \end{array}$ 

0

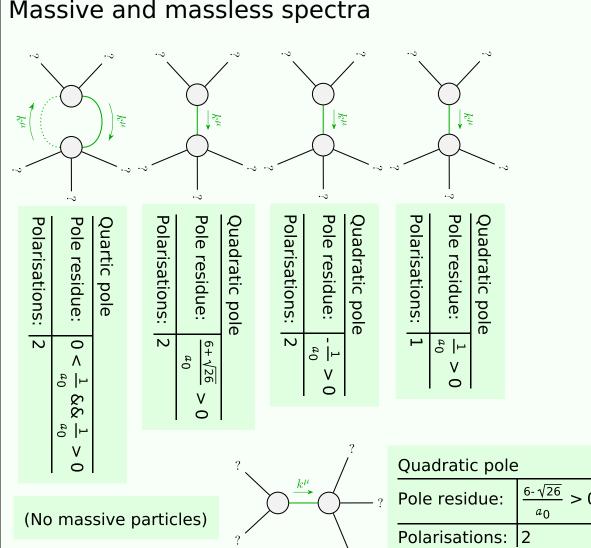
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## Massive and massless spectra



## **Unitarity conditions**

(Unitarity is demonstrably impossible)