Particle spectrograph

Wave operator and propagator

xAct`PSALTer`Private`GraphicsCollage

	ω_0^{*1}	f_{0}^{*+}	$f_{0}^{#2}$	$\omega_{0^{-}}^{\#1}$						
$\omega_{0}^{\#1} + 6$	$5k^2r_3$	0	0	0						
_		0	0	0	,					
$f_{0+}^{#2} \dagger$	0	0	0	0						
$\omega_{0}^{\#1}$ †	0	0	0	$k^2 r_2 +$	- t ₂					
	ω	#1 1 ⁺ αβ		$\omega_{1}^{\#2}{}_{\alpha\beta}$	$f_{1}^{\#1}{}_{\alpha\beta}$	$\omega_{1-\alpha}^{\#1}$	$\omega_{1-\alpha}^{\#2}$	$f_{1-\alpha}^{\#1}$	$f_{1-\alpha}^{\#2}$	
$\omega_{1}^{#1} \dagger^{\alpha \beta}$		2 <i>t</i> 2 3		$\frac{\sqrt{2} t_2}{3}$	$\frac{1}{3}i\sqrt{2}kt_2$	0	0	0	0	
		9		<u>t2</u> 3	<u>ī k t 2</u> 3	0	0	0	0	
$f_{1+}^{#1} \dagger^{\alpha \beta}$	$-\frac{1}{3}\bar{I}$	$-\frac{1}{3}\bar{l}\sqrt{2}kt_2$		$-\frac{1}{3} i k t_2$	$\frac{k^2 t_2}{3}$	0	0	0	0	,
$\omega_{1}^{#1} + ^{\alpha}$		0		0	0	0	0	0	0	
$\omega_{1}^{#2} + \alpha_{1}^{\alpha}$		0		0	0	0	0	0	0	
$f_1^{#1} \dagger^{\alpha}$		0		0	0	0	0	0	0	
$f_{1}^{#2} \dagger^{\alpha}$		0		0	0	0	0	0	0	
										
$\omega_{2^{+}\alpha\beta}^{\#1} f_{2^{+}\alpha\beta}^{\#1} \omega_{2^{-}\alpha\beta\chi}^{\#1}$										
$\omega_{2}^{#1} \dagger^{\alpha}$	0		0	0	h					
$f_{2}^{#1} \dagger^{\alpha}$	0)	0	0	}					
$\omega_2^{#1} \dagger^{\alpha\beta}$)	0	0						
	$\omega_{0}^{\#1} + \frac{1}{6}$ $f_{0}^{\#1} + \frac{1}{6}$ $f_{0}^{\#2} + \frac{1}{6}$ $\omega_{1}^{\#1} + \alpha_{0}^{\#2}$ $\omega_{1}^{\#1} + \alpha_{0}^{\#3}$ $\omega_{1}^{\#1} + \alpha_{0}^{\#3}$ $\omega_{1}^{\#2} + \alpha_{0}^{\#3}$ $f_{1}^{\#1} + \alpha_{0}^{\#3}$ $f_{1}^{\#1} + \alpha_{0}^{\#3}$ $f_{1}^{\#2} + \alpha_{0}^{\#3}$ $f_{1}^{\#2} + \alpha_{0}^{\#3}$	$ \omega_{0}^{\#1} + \begin{vmatrix} 6 k^{2} r_{3} \\ 6 k^{2} r_{3} \end{vmatrix} $ $ f_{0}^{\#1} + \begin{vmatrix} 0 \\ 6 k^{2} r_{3} \end{vmatrix} $ $ f_{0}^{\#1} + \begin{vmatrix} 0 \\ 6 k^{2} r_{3} \end{vmatrix} $ $ \omega_{1}^{\#2} + \begin{vmatrix} 0 \\ 6 k^{2} r_{3} \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 6 k^{2} r_{3} \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{1}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{2}^{\#1} + \begin{vmatrix} \alpha \beta \\ 7 \\ 1 \end{vmatrix} $ $ \omega_{2}^{\#1} + \alpha \beta $ $ \omega_{3}^{\#1} + \alpha \beta $ $ \omega_{4}^{\#1} + \alpha \beta $ $ \omega_{5}^{\#1} + \alpha \beta $ $ \omega_{5}^{$	$\omega_{0}^{\#1} + \begin{vmatrix} 6 k^{2} r_{3} & 0 \\ f_{0}^{\#1} + \begin{vmatrix} 0 & 0 \\ 0 & 0 \end{vmatrix} \\ f_{0}^{\#2} + \begin{vmatrix} 0 & 0 \\ 0 & 0 \end{vmatrix} \\ \omega_{0}^{\#1} + \begin{vmatrix} 0 & 0 \\ 0 & 0 \end{vmatrix} \\ \omega_{1}^{\#1} + \alpha_{1}^{\#1} \\ \omega_{1}^{\#2} + \alpha_{1}^{\#2} \\ \omega_{1}^{\#1} + \alpha_{1}^{\#2} \\ \omega_{1}^{\#1} + \alpha_{1}^{\#2} \\ \omega_{1}^{\#2} + \alpha_{1}^{\#2} \\ \omega_{2}^{\#1} + \alpha_{2}^{\#2} \\ \omega_{2}^{\#2} \\ \omega_{2}^{\#1} + \alpha_{2}^{\#2} \\ \omega_{2}^{\#2} \\$	$ \omega_{0}^{\#1} + \begin{vmatrix} 6 k^{2} r_{3} & 0 & 0 \\ f_{0}^{\#1} + \begin{vmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{vmatrix} \\ f_{0}^{\#2} + \begin{vmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \end{vmatrix} \\ \omega_{0}^{\#1} + \alpha^{\beta} & \frac{2t_{2}}{3} \\ \omega_{1}^{\#1} + \alpha^{\beta} & \frac{\sqrt{2} t_{2}}{3} \\ f_{1}^{\#1} + \alpha^{\beta} & \frac{1}{3} i \sqrt{2} kt_{2} \\ \omega_{1}^{\#2} + \alpha & 0 \\ \omega_{1}^{\#2} + \alpha & 0 \\ f_{1}^{\#1} + \alpha & 0 $ $ f_{1}^{\#1} + \alpha & 0 \\ f_{1}^{\#2} + \alpha & 0 $ $ \omega_{2}^{\#1} + \alpha^{\beta} & 0 $ $ \omega_{1}^{\#2} + \alpha & 0 $ $ f_{1}^{\#2} + \alpha & 0 $ $ \omega_{2}^{\#1} + \alpha^{\beta} & 0 $	$\omega_{0}^{\#1} + \begin{vmatrix} 6k^{2}r_{3} & 0 & 0 & 0 \\ f_{0}^{\#1} + \begin{vmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 &$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\omega_{0}^{\#1} + \begin{pmatrix} 6k^2r_3 & 0 & 0 & 0 \\ f_{0}^{\#1} + \begin{pmatrix} 6k^2r_3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \omega_{0}^{\#1} + \begin{pmatrix} 6 k^2 r_3 & 0 & 0 & 0 \\ f_{0}^{\#1} + \begin{pmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 &$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

 $\{AspectRatio \rightarrow Automatic\}\]$

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Massive and massless spectra

xAct`PSALTer`Private`GraphicsCollage[{Null, Null},
Join[548, {AspectRatio → Automatic}, {Null, Null}, {500}]]

Unitarity conditions