

Wave operator and propagator

Massive and massless spectra



$$\begin{array}{c}
\begin{array}{c} \sigma_2^{1+} \dagger^{\alpha\beta} \\ \tau_2^{1+} \dagger^{\alpha\beta} \\ \sigma_2^{1+} \dagger^{\alpha\beta\chi} \end{array}
\begin{array}{|c|c|c|} \hline 0 & 0 & \frac{2}{t_1} \\ \hline \frac{2}{(1+2k^2)^2} t_1 & \frac{4k^2}{(1+2k^2)^2} t_1 & 0 \\ \hline \frac{2i\sqrt{2}k}{(1+2k^2)^2} t_1 & \frac{2i\sqrt{2}k}{(1+2k^2)^2} t_1 & 0 \end{array}
\end{array}$$

$$\begin{array}{c}
\omega_0^{1+} \dagger^{\alpha\beta} \\
\omega_0^{1+} \dagger^{\alpha\beta\chi} \\
\omega_0^{1+} \dagger^{\alpha\beta\chi}
\end{array}
\begin{array}{|c|c|c|} \hline 0 & 0 & 0 \\ \hline 0 & 0 & 0 \\ \hline 0 & 0 & 0 \end{array}$$

$$\begin{array}{c}
\omega_2^{1+} \dagger^{\alpha\beta} \\
\omega_2^{1+} \dagger^{\alpha\beta\chi} \\
\omega_2^{1+} \dagger^{\alpha\beta\chi}
\end{array}
\begin{array}{|c|c|c|} \hline \frac{t_1}{2} & -\frac{ikt_1}{\sqrt{2}} & 0 \\ \hline \frac{ikt_1}{\sqrt{2}} & k^2 t_1 & 0 \\ \hline 0 & 0 & \frac{t_1}{2} \end{array}$$

$$\begin{array}{c}
\omega_1^{1+} \dagger^{\alpha\beta} \\
\omega_1^{2+} \dagger^{\alpha\beta} \\
f_1^{1+} \dagger^{\alpha\beta} \\
\omega_1^{1+} \dagger^{\alpha} \\
\omega_1^{2+} \dagger^{\alpha} \\
f_1^{1+} \dagger^{\alpha} \\
f_1^{2+} \dagger^{\alpha}
\end{array}
\begin{array}{|c|c|c|c|c|c|c|} \hline k^2 r_5 - \frac{t_1}{2} & -\frac{t_1}{\sqrt{2}} & -\frac{ikt_1}{\sqrt{2}} & 0 & 0 & 0 & 0 \\ \hline -\frac{t_1}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \frac{ikt_1}{\sqrt{2}} & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline 0 & 0 & 0 & k^2 r_5 + \frac{t_1}{6} & \frac{t_1}{3\sqrt{2}} & 0 & \frac{ikt_1}{3} \\ \hline 0 & 0 & 0 & \frac{t_1}{3\sqrt{2}} & \frac{t_1}{3} & 0 & \frac{1}{3} i \sqrt{2} k t_1 \\ \hline 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline 0 & 0 & 0 & -\frac{1}{3} i k t_1 & -\frac{1}{3} i \sqrt{2} k t_1 & 0 & \frac{2k^2 t_1}{3} \end{array}$$