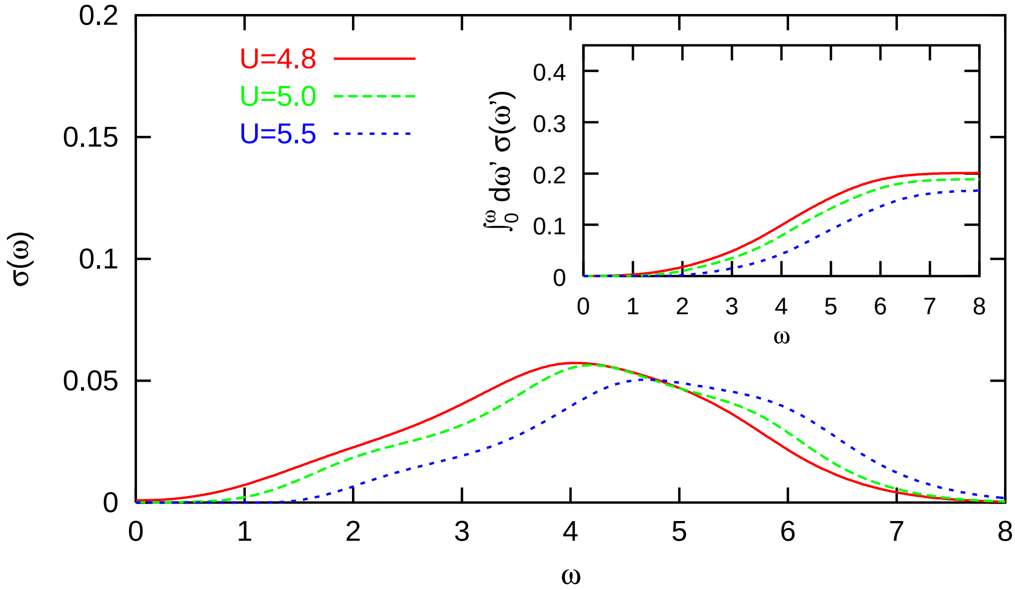

Figure 4.36: Optical conductivity $\sigma(\omega)$ for the isotropic "redefined Bethe lattice" at $T = 0.05$ in the insulating phase. The inset shows the partial f-sum (cf. Fig. 4.34).

band shrinks slightly (by about 15% from $U = 4.8$ to $U = 5.5$).

In the following, plots analogous to the last three figures will be shown (using the same scales) for the stacked Bethe lattice discussed in subsection 4.4.3. For notational simplicity, we will continue to write $\sigma(\omega)$ instead of using the notation $\sigma_{xx}(\omega)$ appropriate for an anisotropic model. We expect to find qualitatively very similar results as for the isotropic model considered before; still the differences will be seen to be significant. In fact, Fig. 4.37 and Fig. 4.38 demonstrate that within the metallic phase both the Drude weights and the total f-sums are reduced significantly compared with the isotropic case. The widths of the Drude peaks, however, are nearly identical. No significant changes are observed in the insulating phase in Fig. 4.39 up to a slight reduction in the total f-sum.

Incoherent Transport

Completely incoherent transport follows both from Stumpf's single-chain view of the Bethe lattice detailed in subsection 4.4.2 and from offdiagonal disorder as discussed in subsection 4.4.4. We will here consider the disordered case which yields an extensive conductivity. The formal expression (4.132) reads for the paramagnetic phase and the choice of units specified above

$$\sigma_{xx}(\omega) = 2\pi \int_{-\infty}^{\infty} \mathrm{d}\omega' \, A(\omega') \, A(\omega' + \omega) \, \frac{n_{\mathrm{f}}(\omega') - n_{\mathrm{f}}(\omega' + \omega)}{\omega} \,. \tag{4.159}$$

The primary new feature seen in Fig. 4.40 and Fig. 4.41 for the metallic phase is