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Correlated-electron transport in flat-band systems

Flatband systems have attracted quite some interests due to their peculiar transport properties. The vanishing of the group velocity in the flatband makes the standard theory of transport not applicable. In recent years it has been shown that the underlying mechanism which allows transport in these system might be related to quantum geometric effects. In our work we study the transport through a model system featuring a flatband in the presence of electron-electron interactions. By using the non-equilibrium Green's function approach we show that interactions can indeed restore the transport in these systems and, unlike in normal dispersive bands, in flatbands a moderate interaction can actually favor the transport.

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