Dynamical properties of SSH and breathing type Hamiltonians
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method based on exact phonon integration in Fourier space and on loop updates
in particle space, we study fermionic systems coupled to dynamical phonons in one
dimension. Within this method it is possible to investigate Su-Schrieffer-Heeger
(SSH) as well as Holstein type models, with momentum dependent couplings (e.g.
breathing phonons) and arbitrary phonon dispersions. We access the dynamical
properties of the systems via momentum dependent phonon spectral functions and
electron Greens functions. In case of the standard Holstein model, we present precise
data for the phonon spectral function in both the metallic Luttinger liquid and the
insulating charge density wave phase, for a wide range of phonon frequencies.

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