DQMC study on Holstein model with momentum-dependent electron-phonon coupling[1] WEI-TING CHIU, RICHARD SCALETTAR, University of California, Davis — We use the determinant quantum Monte Carlo (DQMC) method to study the Holstein model with a momentum-dependent electron-phonon coupling $\lambda(\mathbf{q})$. The correlation functions and their Fourier transformed structure factors are calculated. In addition, the single particle Green's function and spectral functions are obtained. These quantities are used to infer the nature of long-range charge order as well as the renormalization of the electron and phonon propagators. Study of this model is motivated by the suggestion that electron-phonon interaction with large "forward scattering" is relevant to the understanding of the physics of the thin layers of single-unit-cell iron selenide (FeSe) grown on a strontium titanate ($SrTiO_3$) substrate, possibly giving rise to the enhanced superconducting transition temperature and replica bands seen in ARPES experiments.

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