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Continuous-time auxiliary field quantum Monte Carlo study of charge ordering in two-dimensional extended Hubbard model. HANNA TERLETSKA, University of Michigan , TIANRAN CHEN, West Chester University of Pennsylvania, EMANUEL GULL, University of Michigan — The competition between local and non-local long-range Coulomb repulsions in strongly interacting electron systems leads to emergence of complex charge ordering phases. To perform the quantum many-body simulations of such effects, we extend the existing continuous-time auxiliary field quantum Monte Carlo method to incorporate the non-local density-density interactions. We apply the developed method to the two-dimensional extended Hubbard model (with all range of non-local interactions) at and away from the half-filling. We explore the properties of the model in different parameter regimes of short and long range interactions, temperature and fillings.

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