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DMRG Studies for Strongly-Correlated Fermions on a Triangular Optical Lattice MASAHIKO OKUMURA, SUSUMU YAMADA, MASAHIKO MACHIDA, CCSE, Japan Atomic Energy Agency and JST(CREST) — Strongly-interacting fermions in a triangular lattice attract much attention because not only the interaction but also the geometrical frustration is expected to cause non-trivial behaviors. In solids, most of materials parameters, e.g., interaction strength between electrons (fermions), fermion density, and crystalline potential are almost fixed depending on the sample fabrication and our research area are restricted. In contrast, cold atom systems enable to study it systematically because some crucial parameters are precisely controllable. Thus, we expect that the cold Fermi atoms on a triangular lattice bring us information on both strongly-correlated and frustrated systems. In this study, we examine a system described by the triangular Hubbard model by using the parallel density-matrix renormalization group (DMRG). In addition, we also investigate effects of random potential made by speckle laser in the system. We evaluate the effects of frustration, strong interaction, and randomness simultaneously.

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