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Pomeranchuk cooling of SU(N) ultracold fermions in optical lattice[1] ZI CAI, HSIANG-HSUAN HUNG, Department of physics, UCSD, DONG ZHENG, Department of physics, Tsinghua University, CONGJUN WU, Department of physics, UCSD — We investigate thermodynamic properties of a half-filled SU($2N$) Fermi-Hubbard model in two-dimensional square lattice using the determinantal Quantum Monte Carlo simulation. We address the question how the large number of hyperfine-spin components makes thermodynamic properties of SU(N) ultracold fermions different from the conventional Hubbard model with N=2. Various thermodynamic quantities such as entropy, charge fluctuations, and spin correlations have been calculated. We devote special attention to the interaction-induced adiabatic cooling: an analogue of the Pomeranchuk effect in Helium-3.

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