Time-dependent many-variable variational Monte Carlo method for nonequilibrium strongly correlated electron systems KOTA IDO, TAKAHIRO OHGOE, MASATOSHI IMADA, Univ. of Tokyo — Strongly correlated electron systems driven out of equilibrium have attracted much attention because of potential routes to realizing intriguing phenomena that are not attainable in the equilibrium. To treat such systems, we propose a time-dependent trial wave function with many variational parameters for the time-dependent variational Monte Carlo (t-VMC) method [1]. As the trial state, we adopt the generalized pair-product wave function with correlation factors and quantum-number projections. This trial wave function has been proven to accurately describe ground states of strongly correlated electron systems [2]. To show the accuracy and efficiency of our trial wave function in nonequilibrium states as well, we present our benchmarks for relaxation dynamics during and after interaction quench protocols of the Hubbard models both at and away from half-filling. We find that our trial wave function well reproduces the exact results for the time evolution of physical quantities such as momentum distribution and superconducting correlations. We discuss how the accuracy depends on the level of trial wave functions. [1] K. Ido, T. Ohgoe, and M. Imada, arXiv: 1507.00274. [2] D. Tahara and M. Imada, J. Phys. Soc. Jpn. 77,114701(2008).

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