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A new stochastic method superposing multiple Slater determinants KAZUHIRO YABANA, SATOSHI SHINOHARA, HIROFUMI OHTA, TAKASHI NAKATSUKASA, Institute of Physics, Univ. of Tsukuba — In light nuclei, there appear various excited states with different correlation structures. We propose a new stochastic method of superposing multiple Slater determinants which we wish to describe these excited states in a unified way. Our method starts with preparing a lot of Slater determinants whose single-particle orbitals are randomly distributed Gaussian wave packets. They are cooled towards a mean-field solution by the imaginary-time method. In the course of cooling, a lot of shoulder states as well as local minima appear. They exhibit various correlation structures with clustering, deformations, and so on. We store these configurations and then make a configuration mixing calculation with projections with respect to the parity and the angular momentum. To examine usefulness and feasibility of the method, we made a calculation for ^{16}O nucleus employing a simple BKN interaction. We find that our method provides convergent solutions for a few excited states for each spin and parity.

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