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Wang-Landau integration — The application of Wang-Landau sampling in numerical integration YING WAI LI, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Shatin, Hong Kong SAR, China, THOMAS WUEST, DAVID P. LANDAU, Center for Simulational Physics, The University of Georgia, Athens, Georgia 30602, HAI QING LIN, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Shatin, Hong Kong SAR, China — Wang-Landau sampling was first introduced to simulate the density of states in energy space for various physical systems. This technique can be extended to numerical integrations due to certain similarities in nature of these two problems. It can be further applied to study quantum many-body systems. We report the feasibility of this application by discussing the correspondence between Wang-Landau integration and Wang-Landau sampling for Ising model. Numerical results for 1D and 2D integrations are shown. In particular, the utilization of this algorithm in the periodic lattice Anderson model is discussed as an illustrative example.

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