Extensions of the SPEEDUP Path Integral Monte Carlo Code

Dusan Vudragovic

Numerical convergence of quantum mechanical transition amplitudes to their continuum values is significally increased by the Path Integral Monte Carlo effective action approach. Using this approach, long-time quantities are obtained by integrating over the short-time ones, which assume expansion of the effective potential to power series in the time step to a given order. This optimized Path Integral Monte Carlo algorithm is implemented in the SPEEDUP code. In this paper we describe further improvements of the algorithm through the use of the scaled bisection algorithm and quasi-Monte Carlo method for efficient generation of relevant trajectories for several simple quantum models.