

Overcoming the root search in complex trajectory calculations – A final value representation of the coherent state propagator

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Bohmian mechanics with complex action (BOMCA) is a recently developed trajectory method which employs trajectories obeying Newtonian equations of motion but traveling with complex positions and momenta. Although very encouraging results have been obtained for both single surface and multiple surface dynamics, at any instant in time the method uses only a small subset of the trajectories – those which have returned to the real x axis. This makes BOMCA prohibitive in multidimensions, and moreover, interference patterns are not easily recovered.

To overcome these obstacles we have developed a final value representation of BOMCA, by which all trajectory information can be utilized at all times. This significantly reduces the number of trajectories, builds in interference automatically and obviates the need for a root search.