Contribution ID: **15**   Type: **not specified**

Numerical Solutions of Quantum Problems via Bohmian Trajectories

Thursday, 21 June 2012 10:00 (30 minutes)

The aim of the talk is to give an overview of the present status of numerical methods to solve quantum problems via Bohmian trajectories. Particularly I will focus on three relevant approaches for the numerical solution of the Time Dependent Schroedinger Equation (TDSE). The first, called Quantum Trajectory Methods (QTM), developed by Wyatt [1], provides a precise description of quantum dynamics in problems of kinetic chemistry. The second, developed by Oriols [2], gives a numerical method for dealing with quantum many-particle problems. The third treats a generic initial wave function by means of a gaussian approximation. The general intent of the talk is to stress how Bohmian trajectories can solve both numerical difficulties arising in standard techniques and conceptual problems such as the measurement issue.

References

[1] C. L. Lopreore and R. E. Wyatt: Quantum Wavepacket Dynamics with Trajectories, Phys. Rev. Lett. 82, 5190-5193 (1999).
[2] X. Oriols: Quantum-trajectory approach to time-dependent transport in mesoscopic systems with electron-electron interactions, Phys. Rev. Lett. 98, 066803 (2007).

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Session Classification: Part III