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Newtonian trajectories: a powerful tool for solving quantum dynamics FONS BROSENS, University of Antwerp, WIM MAGNUS, IMEC-Leuven — Since Ehrenfest's theorem, the role and importance of the classical paths in quantum dynamics have been examined by several means, and nowadays stochastic versions of the classical equation of motion are being investigated. Along this line, we show that the classical equations of motion provide a solution to quantum dynamics, if appropriately incorporated in the Wigner distribution function, exactly reformulated in a type of Boltzmann equation. Also the quantum-mechanical features of thermal equilibrium are studied in this framework. Even fermions and bosons can be treated on the basis of classical paths, provided the initial distribution function is constructed in agreement with the identical-particle statistics.

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