

MAR08-2007-020396

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Investigating interaction-induced chaos using time-dependent density functional theory

ADAM WASSERMAN, Harvard University

Systems whose underlying classical dynamics are chaotic exhibit signatures of the chaos in their quantum mechanics. In this talk I will discuss the possibility of using time-dependent density functional theory (TDDFT) to study the case when chaos is induced by electron interaction alone. Nearest-neighbor level-spacing statistics are in principle exactly and directly accessible from time-dependent density functional theory (TDDFT). Can the linear response formalism of TDDFT reveal the mechanism of chaos induced by electron-interaction alone? A simple model of a few-electron quantum dot highlights the necessity to go beyond the adiabatic approximation in TDDFT.