Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Magnetosymmetries of nonlinear transport in dissipative conductors[1] SALIL BEDKIHAL, DVIRA SEGAL, University of Toronto, Chemical Physics Theory, Department of Chemistry — We demonstrate with numerically exact simulations that nonlinear transport coefficients obey certain magnetic field symmetries. Our model includes a two terminal Aharonov-Bohm interferometer with a quantum dot located at each of its arms. One quantum dot is interacting electrostatically with a reservoir, a fermionic environment made of a quantum dot coupled to one or more leads. We study the dynamics and steady state properties of this many-body out of equilibrium setup, by using a numerically exact influence functional path integral technique (Phys. Rev.B 82, 205323 (2010)). We show that, in agreement with phenomenological treatments of dephasing and mean field approaches, even (odd) conductance terms obey odd (even) symmetry with threading magnetic flux, as long as system acquires spatial inversion symmetry. When spatial asymmetry is introduced, magnetic field symmetries are broken, but more general symmetries with respect to left-right interchange are obeyed. Finally we also numerically demonstrate that double quantum dot Aharonov-Bohm interferometer coupled electrostatically to a fermionic environment can act as a charge current rectifier when two conditions are met simultaneously (I)broken time reversal and (II) many body effects.

[1]Authors acknowledge funding from NSERC, University of Toronto Department of Chemistry, Queen Elizabeth II graduate scholarship, Gilchrist fellowship

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Date submitted: 09 Nov 2013 Electronic form version 1.4