Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Flux-dependent effects in degenerate and symmetric double dot Aharonov-Bohm interferometer with and without interactions[1] SALIL BEDKIHAL, Chemical Physics Theory Group, University of Toronto, Department of Chemistry, MALAY BANDYOPADHYAY, Department of Physics, Indian Institute of Technology, Bhubaneshwar, DVIRA SEGAL, Chemical Physics Theory Group, University of Toronto, Department of Chemistry — We study the steady-state characteristics and the transient behaviour of the non equilibrium double-dot Aharonov-Bohm interferometer using analytical tools and numerical simulations. Our simple setup includes non-interacting degenerate quantum dots that are coupled to two biased metallic leads at the same strength. A magnetic flux Φ is piercing the set-up perpendicularly. As we tune the degenerate dots energies away from the symmetric point we observe four non trivial magnetic flux control effects: (i) flux dependency of the dots occupation, (ii) magnetic flux induced occupation difference between the dots, at degeneracy, (iii) the effect of "phase-localization" of the dots coherence holds only at symmetric point, while in general both real and imaginary parts are non-zero, and (iv) coherent evolution survives even when the dephasing strength, introduced into our model using Buttiker probe, is large and comparable to the dots energies and the bias voltage. Moreover, not only finite dephasing strength does not destroy the coherence features, it can provide a new type of coherent oscillation. These four phenomena take place when the dot energies are gated, away from the symmetric point,demonstrating the delicate controllability over the dot occupation and coherence.

[1]Authors acknowledge support from NSERC

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Date submitted: 01 Nov 2012 Electronic form version 1.4