Phase-dependent coherence and transport effects in a double-dot Aharonov-Bohm interferometer$^1$ SAVANNAH GARMON, SALIL BEDKIHAL, DVIRA SEGAL, University of Toronto — We study coherence dynamics between two sites comprising a double-dot interferometer attached to non-equilibrium leads. We demonstrate via numerical simulation that a magnetic flux passing through the interferometer results in phase-dependent decoherence in the case of degenerate dots. The precise details of these effects relies on an interplay between Markovian and non-Markovian dynamics. We employ various methods to further investigate these effects analytically, including the derivation of a quantum Langevin equation and a direct calculation of the relevant correlation functions. In addition, we investigate multi-particle scattering states in the same system.

$^1$Center for Quantum Information and Quantum Control (CQIQC), Sloan Fellowship of Dvira Segal

Savannah Garmon
University of Toronto

Date submitted: 11 Nov 2011

Electronic form version 1.4