Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Double-dot charge qubit and transport via dissipative cotunneling MEI-RONG LI, KARYN LE HUR, Département de Physique, Université de Sherbrooke, Sherbrooke, Québec, Canada J1K 2R1 — We investigate electron cotunneling through an exotic charge qubit composed of two strongly capacitively coupled quantum dots (QDs), each being independently connected to a side gate which in general exhibits a fluctuating electrostatic field (*i.e.*, Johnson-Nyquist noise). Two quantum phases are found: the Kondo phase where an orbital- Kondo entanglement emerges and a local moment phase in which the noise destroys the Kondo effect leaving the orbital spin unscreened and resulting in a clear suppression of the conductance. In the Kondo realm, the cotunneling differs from the usual cotunneling through a single dot due to the peculiar phase space for particle-hole excitations; The transfer of charge across the setting is also accompanied by zero-point charge fluctuations in the two dissipative environments and the I-V characteristics are governed by what we call dissipative cotunneling.

Mei-Rong Li
Département de Physique, Université de Sherbrooke,
Sherbrooke, Québec, Canada J1K 2R1

Date submitted: 29 Nov 2004 Electronic form version 1.4