Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Quantum-critical transitions and dissipation in double quantum dots[1] KEVIN INGERSENT, Univ. of Florida — A device consisting of two quantum dots—one strongly interacting and tuned to its Kondo regime, the other effectively a noninteracting resonant level—coupled in parallel to two leads, can be mapped onto a single-impurity Anderson model with a pseudogapped effective density of states [1]. The finite-temperature conductance contains signatures of a quantum phase transition between local-moment and Kondo-screened phases [2]. In this talk I consider possible effects of environmental dissipation, introduced through the coupling of the interacting dot to a bosonic bath characterized by a power-law spectrum. The coupling takes place either via the dot's charge or via one component of its spin. Dissipation tends to suppress internal fluctuations on the interacting dot, and (depending on the bath spectral exponent) may completely destroy Kondo physics. The phase diagrams of the charge- and spin-coupled models will presented, along with thermodynamic and transport properties.

[1] L.G.G.V. Dias da Silva et al., PRL 97, 096603 (2006).
[2] L.G.G.V. Dias da Silva et al., PRB 78, 153304 (2008).

[1]Supported by NSF Grant DMR-0710540.

Kevin Ingersent
Univ. of Florida

Date submitted: 16 Dec 2009 Electronic form version 1.4