Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Electronic transport through a quantum dot with metallic contacts** SURJYO BEHERA, National Institute of Science and Technology, Berhampur, Orissa, India, SHYAMALENDU BOSE, Drexel University, Philadelphia, Pennsylvania, DIDIER NDENGEYINTWALI, Drexel University — We present a microscopic Green's function theory of electrical transport through a quantum dot with metallic contacts. The quantum dot has a single degenerate level where the energy level is split by a structural distortion (Jahn-Teller distortion). The calculation includes the effect of Coulomb blockade as well as the effect of presence of a magnetic impurity. The two metallic leads are represented by the free electron gas model and their interaction with the dot levels provides their width. The J-T distortion order parameter and the occupancy of the dot levels by up and down spin electrons are calculated self consistently as a function of temperature. These results are used to calculate the electrical conductivity as a function of the temperature. It is found that the J-T distortion order parameter depends strongly on the location of the dot energy level with respect to the Fermi level. While this order parameter shows a first order transition (discontinuous drop to zero) in the absence of the width of the dot level, it shows a second order transition and a reentrant behavior (for low dot energy levels) in its presence. The electrical conductivity has strong dependence on temperature, dot energy, its width, J-T distortion parameter, and magnetization due to the magnetic impurity.

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Date submitted: 23 Dec 2009 Electronic form version 1.4