Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magnetic field dependent electronic transport of Mn_4 single-molecule magnet. F. HAQUE, M. LANGHIRT, J.J. HENDERSON, E. DEL BARCO, Department of Physics, University of Central Florida, T. TAGUCHI, G. CHRISTOU, Department of Chemistry, University of Florida — We have performed single-electron transport measurements on a Mn4 single-molecule magnet (SMM) in where amino groups were added to electrically protect the magnetic core and to increase the stability of the molecule when deposited on the single-electron transistor (SET) chip. A three-terminal SET with nano-gap electro-migrated gold electrodes and a naturally oxidized Aluminum back gate. Experiments were conducted at temperatures down to 230mK in the presence of high magnetic fields generated by a superconducting vector magnet. Mn_4 molecules were deposited from solution to form a mono-layer. The optimum deposition time was determined by AFM analysis on atomically flat gold surfaces. We have observed Coulomb blockade an electronic excitations that curve with the magnetic field and present zero-field splitting, which represents evidence of magnetic anisotropy. Level anticrossings and large excitations slopes are associated with the behavior of molecular states with high spin values ($S \sim 9$), as expected from Mn_4.

Firoze Haque
Department of Physics, University of Central Florida

Date submitted: 14 Dec 2009 Electronic form version 1.4