Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Vibronic- and mechanical-spin control in spin-1 molecular devices[1] DAVID RUIZ-TIJERINA, Ohio University, PABLO CORNAGLIA, CARLOS BALSEIRO, Centro Atomico Bariloche and Instituto Balseiro, Argentina, SERGIO ULLOA, Ohio University — Using numerical renormalization group calculations, we study the effect of a vibronic mode on the electronic transport through a deformable spin-1 molecular device. We analyze the experimental situation of Parks et. al. [Science 328 1370 (2010)], where it is observed that stretching the molecule introduces a static magnetic anisotropy. The device is modeled as an interacting two-level system with only one level coupled to metallic leads, in which the static anisotropy is modulated by a vibronic mode. We performed calculations of the local spectral density, which indicate that this dynamic magnetic anisotropy can counter the static effects and drive the ground state into a non Fermi-liquid phase with non-zero spectral density at the Fermi level. It also renormalizes the couplings between the molecule and the metallic leads in an anisotropic fashion, reducing the spin-1 Kondo temperature of the device.

[1]Supported by NSF-PIRE and MWN/CIAM

David Ruiz-Tijerina
Ohio University

Date submitted: 13 Dec 2010 Electronic form version 1.4