

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Molecular Conductors with Center of Mass Motion** KHALED AL-HASSANIEH, Department of Physics, Florida State University and ORNL, G.B. MARTINS, Department of Physics, Oakland University, C.A. BÜSSER, E. DAGOTTO, Department of Physics, University of Tennessee and ORNL — We study numerically the linear conductance of a molecular conductor that can oscillate between the source and drain electrodes.<sup>1</sup> This vibrational mode leads to an asymmetric modulation of the molecule-leads hopping parameters. By expanding this modulation up to the linear order, the conductance can be decomposed into two channels, the direct hopping and the phonon-assisted tunneling channels. The Kondo regime results show conductance dips that can be attributed to the destructive interference<sup>2</sup> of these two channels. If an internal vibrational mode is also active with the effect of symmetric modulation of the tunneling barriers, the particle-hole symmetry is broken and a Fano-like interference is observed.

<sup>1</sup> K.A. Al-Hassanieh et al - Preprint

<sup>2</sup> Büsser et al, cond-mat/0404426 (to appear in Phys. Rev B).

Khaled Al-Hassanieh  
Department of Physics, Florida State University and ORNL

Date submitted: 30 Nov 2004

Electronic form version 1.4