Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Understanding Crosstalk Between Parallel Molecular Wires MATTHEW REUTER, Computer Science and Mathematics Division, Oak Ridge National Laboratory, TAMAR SEIDEMAN, MARK RATNER, Department of Chemistry, Northwestern University — Cooperative effects between molecular wires affect conduction through the wires, and studies have yet to clarify the conditions under which these effects enhance (diminish) conduction. Using a simple but general model, we attribute this crosstalk to the duality of energetic splitting and phase interference between the wires' conduction channels. In most cases, crosstalk increases (decreases) conductance when the Fermi level is far from (close to) an isolated wire's resonance. Finally, we discuss strategies for controlling crosstalk between parallel molecular wires.

[1] M. G. Reuter et al. J. Phys. Chem. Lett. 2, 1667-1671 (2011).
[2] M. G. Reuter et al. Nano Lett. 11, 4693-4696 (2011).

Matthew Reuter
Computer Science and Mathematics Division,
Oak Ridge National Laboratory

Date submitted: 28 Nov 2011 Electronic form version 1.4