Abstract Submitted
for the 4CF07 Meeting of
The American Physical Society

Many-body treatment of quantum transport through single molecules JUSTIN BERGFIELD, CHARLES STAFFORD, University of Arizona — Electron transport through single molecules represents a natural evolution of *mesoscopic physics* to the ultimate limit of smallness. An important respect in which single-molecule devices differ from mesoscopic systems is that molecules possess *exact spatial symmetries*, which are manifested in their quantum transport properties. In this talk, we investigate the effect of molecular symmetries on multiterminal quantum transport through single benzene molecules, treating the lead-molecule couplings perturbatively via a Dyson expansion, but including intramolecular correlations exactly using the nonequilibrium Green function approach. It has become increasingly clear that an accurate treatment of intramolecular correlations is necessary to provide a realistic model of electron transport through single molecules, and hence to achieve quantitative agreement with conductance experiments.

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Date submitted: 14 Sep 2007 Electronic form version 1.4