Abstract Submitted
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Chaotic Electronic Transport in Nanocluster Wires M.S. FAIRBANKS, Department of Physics, University of Oregon, T.P. MARTIN, School of Physics, University of New South Wales, Australia, C.A. MARLOW, B.C. SCANNELL, Department of Physics, University of Oregon, S.A. BROWN, Department of Physics and Astronomy, University of Canterbury, New Zealand, R.P. TAYLOR, Department of Physics, University of Oregon — Electronic circuits featuring nanoscale devices are highly topical due to their potential for exhibiting novel device functionality and fundamental solid-state physics. Circuits based on nanoclusters are particularly appealing because they "self-assemble" [1]. Here we develop a theoretical transport model for nanowires formed from nanoclusters. The wire width varies along the wire's length, creating an array of connected cavities. The wire walls reflect electron trajectories through material-induced chaotic scatterers within each cavity. We discuss how the chaotic properties can be engineered to increase the conductivity's sensitivity to electric and magnetic fields for use as novel sensors. [1] For example, J. G. Partridge, et al., Microelectronic Engineering 83, 1460 (2006).

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