Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Dependence of Conductance Resonanoces and Modulations on Channel Length in Asymmetric Quantum Point Contacts (QPCs)[1] HAO ZHANG, Duke University, PHILLIP WU, Lund University, ALBERT CHANG, Duke University — Transport features below $2e^2/h$ show resonance peaks in highly asymmetric QPCs. As we increace the channel length, the number of peaks observable also increases. We characterize the number of peaks and/or oscillations as a function of channel length, when the QPC is tuned to or below the first quantum channel. The the number of peaks/oscillations appears to increase on average as the channel length increases. In addition, we find preliminary evidence that there is a correspondence between the resonance peaks and the zero-bias anomaly(ZBA) in the differential conductance. These behaviors are consistent with an interpretation based on the formation of quasi-bound-states within the QPC channel in the single-mode limit.

[1]Work support by NSF DMR 0701948

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Date submitted: 09 Nov 2011 Electronic form version 1.4