

Abstract Submitted
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Electronic transport in loops comprised of individual carbon nanotubes JINSEONG HEO, GIL REFAEL, MARC BOCKRATH, Caltech — We discuss electronic transport in loops comprised of individual carbon nanotubes. The conductance versus gate voltage shows oscillations with a number of periods. These oscillations persist up to temperatures ~ 50 K. We compare our results with a model [Dear APS organizers: please note the theoretical talk on the same subject given by Gil Refael. We would like to reference this talk if possible in this abstract.] that accounts

for the interference of counterpropagating electron waves around the loop, analogous to a Sagnac interferometer in optics. In this model, the different velocities for right and left movers in the two carbon nanotube bands produce large energy scale interference oscillations. We find semi-quantitative agreement between our data and the theory. These results may enable phase coherence in nanotubes to be studied up to temperatures much higher than the cutoff imposed by thermal smearing.

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