Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Current dependent dephasing in an Aharonov-Bohm Interferometer KUAN-TING LIN, YIPING LIN, J. C. CHEN, Department of the Physics, National Tsing Hua University, Hsinchu 30013, Taiwan, T. UEDA, S. KOMIYAMA, Department of Basic Science, University of Tokyo, Komaba, Tokyo 153-8902, Japan
— We have studied the temperature dependence of the current induced dephasing rate in a ballistic GaAs/$Al_xGa_{1-x}As$ ring. The dephasing rate is linearly proportional to the temperature regardless of the current applied. The AB oscillations are suppressed by the increase of the excitation current; however, the dephasing becomes less temperature dependent. Our observations cannot be interpreted by Joule heating effect. Possible decoherence mechanisms caused by the excess current will be discussed.

Kuan-Ting Lin
Department of the Physics, National Tsing Hua University,Taiwan

Date submitted: 21 Nov 2008 Electronic form version 1.4