

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Magnetometry with Quartz Tuning Fork LU CHEN, FAN YU, ZIJI XIANG, COLIN TINSMAN, TOMO ASABA, BENJAMIN LAWSON, Department of Physics, University of Michigan, Ann Arbor, 450 Church Street, Ann Arbor, MI 48109, WEIDA WU, Department of Physics and Astronomy, Rutgers University, 136 Frelinghuysen Road, Piscataway, NJ 08854-8019, LU LI, Department of Physics, University of Michigan, Ann Arbor, 450 Church Street, Ann Arbor, MI 48109 — Quartz tuning forks are the driving force for the recent progress of atomic force microscopy. As a high Q oscillator, it is potentially a frequency modulated cantilever for magnetometry. In our study, we developed a new method for mounting tuning forks. With a bismuth single crystal attached to a free prong, the tuning fork device is driven by AC voltage and the responding current is measured at the same time. We observed sharp resonance in both the magnitude and phase of current at temperature down to 0.35K. In magnetic field up to 10 T, the phase of current shows quantum oscillations which are periodic with respect to $\frac{1}{B}$. The extracted Fermi surfaces are consistent with those of bismuth crystals.

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Date submitted: 20 Nov 2016

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