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Micromachined Angle Resolved ^{3}He Quasi-particle Detector[1]
YOONSEOK LEE, C.S. BARQUIST, P. ZHENG, W.G. JIANG, Department of Physics, University of Florida, Gainesville, FL, T.R. SCHUMANN, Y.K. YOON, Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL — Micromachined comb-drive mechanical resonators have been developed for the study of quantum fluids. Our study in ^{3}He-B showed that the temperature dependence of the damping in this device was consistent with a damping model derived from thermal quasi-particles and demonstrated its potential as a sensitive quasi-particle flux detector. It is natural to conceive a scheme to build angle-resolved or space-momentum resolved ^{3}He quasi-particle detectors in the form of array of resonators. This type of detectors could play an important role in revealing detailed structure of excitations or visualizing vortices in quantum fluids. A prototype detector is composed of 4×4 or 6×6 array of comb-drive resonators with strategically dispersed resonance frequencies. In this paper, We will discuss the working principle and design of the detector array.

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