Abstract Submitted
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Glass Microfluidics for Quantum Fluids in Restricted Geometries[1] J. P. DAVIS, X. ROJAS, University of Alberta, Dept of Physics — Over the past few years we have developed a suite of measurements based on precisely defined glass microfluidic structures. Such measurements include sound velocity and attenuation in an acoustic analog of a Fabry-Perot cavity [1] and now a superfluid ^{4}He nanomechanical Helmholtz resonator [2]. The latter is capable of precisely determining the superfluid density, which will be useful of exploration of Majorana fermions at the surface of ^{3}He-B [3], as well as studies of quantum nanomechanical resonators. I will describe our devices and measurements, as well as possible future measurements including studies of quantum turbulence and low-temperature optomechanics [4]. [1] X. Rojas, B. D. Hauer, A. J. R. MacDonald, P. Saberi, Y. Yang and J.P. Davis, Phys. Rev. B 89, 174508 (2014). [2] X. Rojas and J.P. Davis, arXiv:1410.5879 (2014). [3] H. Wu and J. A. Sauls, Phys. Rev. B 88, 184506 (2013). [4] L. A. DeLorenzo and K. C. Schwab, New J. Phys. 16, 113020 (2013).

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