Abstract Submitted
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A Variable Path Length Cell for Transverse Acoustic Studies of Superfluid ^{3}He C.A. COLLETT, M.D. NGUYEN, J.I.A. LI, A.M. ZIMMERMAN, W.P. HALPERIN, Northwestern University, Evanston, IL 60208, USA, J.P. DAVIS, University of Alberta, Edmonton, AB, Canada T6G 2R3 — Transverse sound has recently emerged as an effective probe of the order parameter of superfluid ^{3}He. Both the transverse acoustic impedance[1] and attenuation[2] have been shown to couple to surface bound states in ^{3}He-B, which are predicted to be Majorana states in the specular scattering limit. In order to measure the attenuation at different path lengths to separate surface from bulk effects, as well as reduce the cavity size to the micron scale where transverse sound propagation should be measurable in the normal state,[3] we have constructed a variable path length cell. Using a ^{4}He-actuated diaphragm we demonstrate in-situ changes to the cavity length at dilution temperatures, and report our progress in deploying the cell at sub-mK temperatures. This research was supported by the National Science Foundation grant DMR-1103625.

[1]R. Nomura *et al.*, Physica E **55**, 42-47 (2014)
[2]J.P. Davis *et al.*, Nature Physics **4**, 571-575 (2008)
[3]L.D. Landau, Sov. Phys. JETP **32**, 59 (1957)

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