

Abstract Submitted  
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**Third Sound in Superfluid Helium Films Adsorbed on Packed Multiwall Carbon Nanotubes**<sup>1</sup> REBECCA ROYCROFT, EMIN MENCHEKANIAN, GARY WILLIAMS, University of California, Los Angeles — We are studying the propagation of third sound in thin <sup>4</sup>He films adsorbed on multiwall carbon nanotubes. The nanotubes of 12.5-nm average diameter are lightly packed into an annular resonator, with a resistor bolometer used to detect temperature oscillations accompanying the waves. Standing-wave modes are excited by mechanical vibrations as well as heater drive, with FFT analysis allowing measurement of both the sound speed and dissipation. Initial experiments showed split harmonic frequencies, which have been resolved in a subsequent experiment using a different packing scheme. We observe the KT onset transition, and then at higher thicknesses capillary condensation becomes important. At 1.3 K we do not observe layering effects; lower-temperature measurements may be necessary to see these effects.

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Rebecca Roycroft  
University of California, Los Angeles

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