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High Frequency Transverse Acoustics in Superfluid ^{3}He JOHN P. DAVIS, HYOUNGSOON CHOI, JOHANNES POLLANEN, WILLIAM P. HALPERIN, Northwestern University — Acoustic studies of superfluid ^{3}He have a rich history and have contributed significantly to our understanding. Recently we have made technical advances that have allowed us to extend transverse acoustic measurements to higher frequencies. We will discuss these techniques, as they are applicable to a broad range of acoustic measurements. The relevant frequency in superfluid ^{3}He is associated with the pair energy, which varies from 69 to 194 MHz in the range of 0 to 34 bar. With our improved acoustic response, up to the 200 MHz range, we can probe the structure of the order parameter deep into the superfluid at higher pressures than before. This has allowed us to make precision measurements of one of the collective modes of superfluid ^{3}He, the Imaginary Squashing Mode [1]. From these measurements we have extracted values for the strength of f-wave pairing interactions in this dominantly p-wave superfluid. We will discuss our results in comparison with earlier measurements from the Acoustic Faraday Effect [2]. [1] J.P. Davis, H.Choi, J. Pollanen, and W.P. Halperin, Phys. Rev. Lett. **97**, 115301 (2006). [2] Y. Lee, T.M. Haard, W.P. Halperin and J.A. Sauls, Nature **400**, 431 (1999).

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