Abstract Submitted
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Modes of targets in water excited and identified using radiation pressure of modulated focused ultrasound[1] TIMOTHY DANIEL, AUBERRY FORTUNER, Washington State Univ, AHMAD ABAWI, HLS Research, IVARS KIRSTEINS, NUWC, PHILIP MARSTON, Washington State Univ — The modulated radiation pressure (MRP) of ultrasound has been widely used to selectively excite low frequency modes of fluid objects [1,2]. We previously used MRP to excite less compliant metallic object in water including the low frequency modes of a circular metal plate in water. A larger focused ultrasonic transducer allows us to drive modes of larger more-realistic targets. In our experiments solid targets are suspended by strings or supported on sand and the modulated ultrasound is focused on the target's surface. Target sound emissions were recorded and a laser vibrometer was used to measure the surface velocity of the target to give the magnitude of the target response. The source transducer was driven with a doublesideband suppressed carrier voltage as in [1]. By varying the modulation frequency and monitoring target response, resonant frequencies can be measured and compared to finite element models. We also demonstrate the radiation torque of a focused first-order acoustic vortex beam associated with power absorption in the Stokes layer adjacent to a sphere. [1] P. L. Marston and R. E. Apfel, J. Acoust. Soc. Am. 67, 27–37 (1980). [2] S. F. Morse, D. B. Thiessen, and P. L. Marston, Phys. Fluids 8, 35 (1996).

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