Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Measurements of Collective Mode Frequencies in a Multicomponent Quantum Gas JOSHUA HILL, JAMES AMAN, THOMAS KILLIAN, Rice University — The frequencies of collective oscillatory modes provide a powerful probe of many-body physics in ultracold atomic gases. Here, we describe our characterization of collective modes which are excited trapped samples of ultracold strontium. A cold thermal-gas of Strontium atoms is prepared in a succession of magneto-optical trap (MOT) stages before being evaporatively cooled in an optical dipole trap (ODT). Additional confinement is then introduced by ramping on a second laser beam, the potential minimum of which is overlapped with the ODT. While maintaining the ODT, the second beam is rapidly turned off, and the gas undergoes collective-mode oscillations. These oscillations are clearly visible in the calculated temperature of the gas after time-of-flight absorption imaging. We identify both center of mass (sloshing) and quadrupole modes.

Joshua Hill
Rice University

Date submitted: 24 Jan 2018 Electronic form version 1.4