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Exploration of Whispering Gallery Modes in an Optically Trapped Aerosol Droplet ANGELA LUDVIGSEN, LOWELL MCCANN, University of Wisconsin - River Falls — Optical traps use a laser beam to catch and hold small transparent objects. Past observations of optically trapped aqueous aerosol droplets have shown that the droplet moves between two or more stable positions depending upon the power of the trapping laser. It is hypothesized that this movement coincides with a resonance of the light with the droplet called a Whispering Gallery Mode. When the resonance occurs, additional forces act on the droplet. To investigate this behavior, Raman scattered light from the droplet is measured using a spectrometer while simultaneously recording the droplet's position. The Raman spectrum exhibits a series of peaks that appear due to the very spherical shape of the droplet called Cavity Enhanced Raman Spectroscopy. The location and spacing of the peaks are related to the diameter and the optical properties of the droplet. In order to achieve an accurate determination of the radius from this spectrum, the magnitude of the electric and magnetic fields of the light scattered off the droplet are calculated. This allows for a precise measurement of the droplet's radius at the moment that the droplet moves between stable positions.

Angela Ludvigsen
University of Wisconsin - River Falls

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