Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Toolkit for the Automated Characterization of Optical Trapping Forces on Microscopic Particles[1] JOSEPH GLASER, Cleveland State University, DAVID HOEPRICH, Applied Medical Physics In Radiology, Inc, ANDREW RESNICK, Cleveland State University — Optical traps have been in use in microbiological studies for the past 40 years to obtain noninvasive control of microscopic particles. However, the magnitude of the applied forces is often unknown. Therefore, we have developed an automated data acquisition and processing system which characterizes trap properties for known particle geometries. Extensive experiments and measurements utilizing well-characterized objects were performed and compared to literature to confirm the system's performance. This system will enable the future analysis of a trapped primary cilium, a slender rod-shaped organelle with aspect ratio L/R >30, where 'L' is the cilium length and 'R' the cilium diameter. The trapping of cilia is of primary importance, as it will lead to the precise measurements of mechanical properties of the organelle and its significance to the epithelial cell.

[1]Support from the National Institutes of Health, 1R15DK092716 is gratefully acknowledged

Andrew Resnick
Cleveland State University

Date submitted: 13 Nov 2013 Electronic form version 1.4