Abstract Submitted for the MAR08 Meeting of The American Physical Society

Colloidal Particle Geometry and Its Effect on Optical Trapping

RACHAEL HARPER, ALEX LEVINE, Department of Chemistry & Biochemistry, University of California Los Angeles — Recent experiments by Wilking and Mason (Europhysics Letters, in press) on the laser trapping of colloids of various shapes (the letters of the alphabet) show that for identical chemistries the trapping force varies wildly with particle shape. In fact, certain shapes do not trap at all. Motivated by these experimental results, we explore the trapping of particle of variable shape using a ray-optics simulation. This numerical tool allows us to perform Monte Carlo integrations of the total trapping forces and torques for a series of objects such as a cross (the letter "x") or a beam (the letter "I"). We find that certain shapes feature bi-stable trapping positions/orientations, and some, indeed, do not allow for trapping at all.

Rachael Harper Department of Chemistry & Biochemistry, University of California Los Angeles

Date submitted: 03 Dec 2007 Electronic form version 1.4