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Optical Trapping of Colloidal Nanoparticles by a Weakly Focused Laser Beam CHUN-YU LIN, HSIA-YU LIN, Lehigh University, SHEAN-JEN CHEN, STEVEN M.T. WEI, H.D. OU-YANG, Lehigh University — We present an analysis of the behavior of an ensemble of colloidal nanoparticles in the focal region of a weakly focused laser beam. Using a mechanical balance of the laser radiation pressure that causes particle migration into the light field and the osmotic pressure of these particles opposing migration, we propose a new method for quantifying the optical trapping potential of individual particles by measuring the increase of the particle concentration as a function of the laser intensity. We find comparable results for the optical trapping potential from this method with values obtained by single particle trapping methods, indicating that radiation-induced particle convection from a weakly focused laser beam does not affect the steady state distribution of the particles in the light field.

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