

Direct measurements of colloidal forces via optical laser tweezers

박범준<sup>†</sup>, 임진현, 강동우

경희대학교

(bjpark@khu.ac.kr<sup>†</sup>)

Optical laser tweezer or the single-beam gradient force trap has been utilized to directly measure the interaction force between dielectric microspheres in pico-newton scales. In ray optics regime, where the size of a particle is larger than the wavelength of a light, we demonstrate that the optical trapping force can be analytically calculated by the geometrical optics approximation. Using the optical laser tweezer apparatus, we quantitatively investigate physical properties of various colloidal systems, e.g., interactions between PMMA particles in a low dielectric constant medium, critical electrolyte concentrations for particle adsorption to fluid-fluid interfaces, and aspect ratio-controlled capillary forces of ellipsoid particles.