

Abstract Submitted
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Mapping optical trapping energy of nanoparticles via confocal microscopy¹ MIN YAO LIM, Carleton College — Optical traps are highly focused laser beams that can hold and manipulate objects of microscopic scale. They are used to study the motion and energy of particles such as colloids or DNA molecules. In order to achieve this purpose we first propose to determine the energy of optical traps. We use a fluorescent nanoparticle ensemble within the optical trapping volume along with confocal microscopy to map the fluorescence intensity distribution of nanoparticles. This mapping allows us to calculate the trapping energy profile in three dimensions. We repeat this process with different trapping powers to find the depth of the trapping potential well as a function of trapping power. Trapping energy per trapping power thus measured is consistent with results obtained through previous methods such as fluorescence correlation spectroscopy conducted by our research group. With this technique of mapping trapping energy we can further study particle-particle interactions.

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