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Depletion-Driven Selective Optical Trapping in Nanoparticle Suspensions YI HU, JOSEPH JUNIO, H.D. OU-YANG, Lehigh University — We report results of an optical trapping study that demonstrates the effects of size-asymmetric particles in suspension have on optical trapping efficiency. Using a model colloid system with selective fluorescent dying and particle sizing, we show that the trapping efficiency of nanoparticles can be effectively tuned by adding different sized particles, promoting the use of optical trapping for particle sorting. A variable power IR laser coupled into a high NA objective was used for trapping. For particle detection, we used a 532nm excitation laser aligned to be parfocal with the IR trapping beam through the same objective lens. Fluorescent signals emanating from the focal region common to both beams was band-passed to a pinhole set to be conjugate to the focal region for confocal detection. In a system composed of 160nm and 63nm particles we demonstrated the synergistic effect of size mixing. Experimental results are also shown for fluorescent particles being driven out of the region by size selective trapping of undyed 160nm particles.

Joseph Junio
Lehigh University

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