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**Measuring colloidal osmotic compressibility of a polymer-crowded colloidal suspension by optical trapping** JINXIN FU, VURAL KARA, H. DANIEL OU-YANG, Lehigh University — Particle interactions determine the stability of nanoparticle suspensions and the phase separation of particle-polymer mixtures. However, due to the small sizes of the dispersed nanoparticles, it is not easy to directly measure interaction forces between particles in a colloidal suspension. In this paper, we propose an "Optical Bottle" approach to quantify these particle interactions in a suspension by measuring the colloidal osmotic compressibility of the nanoparticles. Virial expansion of the colloidal osmotic compressibility yields virial coefficients of different orders. The second order virial coefficient of aqueous suspensions of colloidal polystyrene nanospheres in the presence of high-salt (KCl) and polyethylene glycol (PEG) is found to decrease with increasing PEG concentration, suggesting an attractive depletion interaction between the PEG-crowed polystyrene particles.

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