

Abstract Submitted
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Depletion-Enhanced Nanoparticle Compressibility JOSEPH JUNIO, H.D. OU-YANG, Lehigh University — Binary mixtures of colloids have been widely studied for their ability to spontaneously phase separate under certain size and mixing proportions. This separation is theorized to be due to induced entropic depletion attractions, where smaller particles gather and crowd out the larger ones. A consequence of this induced attraction is an enhanced osmotic compressibility. With an optical bottle, we were able to use the gradient force from a focused laser to locally concentrate nanoparticles in the presence of small polymers, and quantitatively analyze the increased density as a function of laser power, and calculate the osmotic compressibility. Measurements of the compressibility of the binary suspension as a function of added polymer were conducted to determine the strength of the induced depletion attraction and its effects on phase separation. Theoretical calculations of the expected compressibility for suitably defined binary systems are compared to experimental results.

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