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Interparticle Potential in a 1-D Many Body Colloid

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INTERPARTICLE POTENTIAL IN A 1-D MANY-BODY COLLOID

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We present a study of the interparticle potential in a 1-dimensional colloid. Using a scanning optical tweezer we fabricate a line trap confining many silica spheres one-micron in diameter. Optical forces result from an interaction between induced dipoles within each sphere and scattered laser light from neighboring spheres[1]. These interactions create a potential which induces a preferred separation between spheres. Furthermore, many-body effects may alter the interactions in colloidal systems[2]. Brownian effects cause random motion of the particles within the trap allowing the system to exhibit a range of interparticle separations. Using statistical analysis we look at the distribution of separation distances as a means of exploring the interparticle potential in the 1-dimensional, many-body colloidal system.

[1]Burns, Michael M., *et al.* *Science*, 249, 749 (1990).
[2]Larsen, Amy E. and Grier, David G. *Phys. Rev. Let.*, 76, 3862 (1996).