

Development of a Colloidal Force-Distance-Adsorption Apparatus for Particle Science Research and Education

William Ducker, John Walz, Spencer Clark

Department of Chemistry, Virginia Tech

Department of Chemical Engineering, Yale University

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AFM is a very common technique for measuring the forces on particles and for imaging. In conventional AFM there is no direct measurement of distance normal to the sample. We have developed a method for measuring this distance. We generated an evanescent wave in an AFM sample and have measured the scattering of the evanescent wave to determine the distance between the AFM probe and the sample. This development can be used for accurate measurement of forces (particularly in the presence of adsorbates) and accurate mapping of surface structures.

Evanescent wave scattering from an AFM tip shows a simple logarithmic dependence on displacement from sample, so it can be used for displacement measurement.

