Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Quantitative Atomic-Resolution Surface Force Field Spectroscopy in Three Dimensions: A *How-To* Guide for Collecting Meaningful Data MEHMET Z. BAYKARA, Bilkent University, OMUR E. DAGDEVIREN, Yale University, TODD C. SCHWENDEMANN, Southern Connecticut State University, HARRY MÖNIG, Westfaelische Wilhelms-Universitaet Muenster, ERIC I. ALTMAN, UDO D. SCHWARZ, Yale University — Three-dimensional atomic force microscopy (3D-AFM) is being increasingly used to measure the chemical interactions between an atomically sharp probe tip and surfaces of interest in terms of atomic-scale forces and energies in three dimensions. Since the results provided by 3D-AFM may be affected by piezo nonlinearities, thermal and electronic drift, tip asymmetries, and elastic deformation of the tip's apex, these effects need to be considered during data interpretation. In this talk, we analyze the impact of these effects on the data, compare different methods to record atomic-resolution surface force fields, and determine the approaches that suffer the least from associated artifacts. We conclude that efforts to reduce unwanted influence of tip properties on recorded data are indispensable to extract detailed information about atomic-scale properties of the surface.

Mehmet Z. Baykara
Bilkent University

Date submitted: 07 Oct 2012 Electronic form version 1.4