

Abstract Submitted
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A Numerical Investigation of the Non-Linear Interaction Forces in Tapping Mode Atomic Force Microscopy NASTARAN HASHEMI, MARK PAUL, Virginia Tech — There is an important need to measure the topography of soft materials including many of biological importance. Such soft and fragile materials can easily be damaged by the use of conventional nanoscale materials characterization instrumentation. Tapping mode atomic force microscopy routinely measures the topography of materials with atomic resolution. For soft materials this is limited by the nonlinear contact forces imposed upon the sample by the oscillating cantilever tip. A fundamental understanding of these forces could lead to techniques capable of minimizing the possibly destructive tip-sample interactions. A physical model of the contact interactions is constructed and numerical simulations of the cantilever dynamics are presented to explore these possibilities.

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