

Abstract Submitted
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Tuning the instability in Static Mode Atomic Force Spectroscopy by applying electric field¹ SOMA DAS, S.N. Bose National Centre for Basic Sciences, P.A. SREERAM, Indian Institute for Science Education and Research, ARUP K. RAYCHAUDHURI, S.N. Bose National Centre for Basic Sciences — We study the force-distance (f-d) curves in the absence and presence of a dc bias between the cantilever tip and sample using Atomic Force Microscope (AFM). We find a new kind of bistability in the f-d curves obtained from Atomic Force Spectroscopy. The experimental signatures for this bistability point to a hysteresis like phenomenon when the f-d curves are cycled through the approach and retract paths. Interestingly, it is also observed that on application of a dc bias between the cantilever tip and sample, this bistability in the f-d curves can be tuned. This means that the “jump-into-contact” and “jump-off-contact” positions in the f-d curves change with the applied dc bias while keeping the other parameters constant. We simulate a simple model for AFM and show that this bistability is a characteristic feature of the experimental procedure and it can be controlled by applying a bias externally between the tip and sample.

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