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Electro-mechanical contact formation between conductive AFM cantilevers and carbon nanotubes TAREK GHANEM, Georgia State University, ELLEN WILLIAMS, MICHAEL FUHRER, University of Maryland — We present a study of the electro-mechanical contact formation between conductive atomic force microscope (AFM) cantilevers and carbon nanotubes. We study the dependence of the current through the contact on loading force, geometric parameters, bias conditions, and time. We find that for an optimized placement of the cantilever, the current through the contact becomes independent of the loading force beyond a certain threshold. In that load-independent regime, the current is also independent of bias conditions, and is stable in time. Under certain conditions of tip placement, the current through the contact exhibits non-monotonic behavior with loading. This behavior is well explained by the parasitic planar motion of the cantilever during loading.

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