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**Measuring AFM Cantilever Spring Constants** KATIE CHYNOWETH, MAHLON WIGTON, KRISTINE LANG, Colorado College and NIST — Josephson-junctions are prime candidates for the realization of quantum bits. Understanding the properties of Josephson-junction materials is crucial to building a functional qubit. Conducting atomic force microscopy (CAFM), which can simultaneously measure local topography and conductance, is a promising tool for these purposes. Previous results suggest that control of the imaging force in CAFM is vital to achieve reproducible conductance images. In this talk, we discuss how control of the imaging force can be achieved by measuring the CAFM cantilever spring constant, and how this results in reproducible conductance images. The theoretical background and the experimental technique for measuring the spring constant by two distinct methods will be discussed. We present spring constant measurements from these two methods for comparison. Finally, we present our user-friendly program which measures the spring constant in situ on a Digital Instruments atomic force microscope.

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