Method for lateral force calibration in atomic force microscope using MEMS microforce sensor.

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Abstract

This presentation shows a simple and direct method for the lateral force calibration constant determination. Our procedure does not require any knowledge about material or geometrical parameters of an investigated cantilever. We apply a commercially available microforce sensor with precise electronics for direct measurement of the friction force applied by the cantilever's tip to a flat surface of the microforce sensor measuring beam. Due to the third law of dynamics, the friction force of the equal value tilts the AFM cantilever. Therefore, torsional (lateral force) signal is compared with the signal from the microforce sensor and the lateral force calibration constant is determined. The method is easy to perform and could be widely used for the lateral force calibration constant determination in many types of atomic force microscopes.

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