MEMS device for lateral force calibration in the atomic force microscope: Lateral electrical nanobalance

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We have developed a compact and easy-to-use MEMS device for lateral force (and hence also frictional force) calibration of AFM cantilevers. In turn, a non-contact method has been developed for measuring the lateral spring constant of these artefacts, by a combination of electrical measurements and Doppler velocimetry[1]. This Lateral Electrical Nanobalance (LEN) can be made traceable to the SI, which is crucial to ensure that force measurements by AFM are comparable to those made by optical tweezers and other methods. This forms a basis for frictional force measurements[2], one of the most promising methods of surface chemical identification at nanometre resolution.
References


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