

Abstract Submitted
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Resonant Measurement of Coupling Forces Between Two Microcantilevers¹ ONUR BASARIR, KAMIL L. EKINCI, Dept. of Aerospace and Mechanical Eng., Boston University — Here we studied the nature of nonlinear coupling forces between two microcantilevers. We employed a resonant measurement technique similar to that used in non-contact atomic force microscopy (NC-AFM). A stiff cantilever, which was driven at its resonance at a constant amplitude, was brought to the close vicinity of a second cantilever excited by thermal noise. A spectral analysis of the displacement signal of the driven cantilever revealed the effects of the coupling forces at the sum and difference frequencies of the resonances of two microcantilevers. From this, the resonance frequency and the quality factor of the thermally excited cantilever were extracted. As the nominal distance between the two cantilevers was reduced, we observed an increase in the dissipation as well as a shift in the resonance frequencies. We shall discuss how these observations may lead to a better understanding of the coupling forces.

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Onur Basarir
Dept. of Aerospace and Mechanical Eng., Boston University

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