

Small cantilevers to penetrate the market

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For a decade, a small cantilever has been believed as a foregone conclusion for scanning probe microscopy in biophysics field. However, it seems to be still in the process, at least in business. What has made us hesitate to getting on board a train?

A small cantilever sized in around 10 micron long and 2 micron wide has been used in the research of high speed AFM.^{(1),(2)} But it is not compatible for commercially available AFMs. Therefore, many of researchers had less chance to use such an extremely small cantilevers. We assumed that a medium small size cantilever which is smaller than conventional cantilevers while being compatible with conventional AFM optical sensors would open the door of small world express. 'Bio-Lever mini', or BL-AC40TS-C2, has been introduced recently into the market, based on the assumption.⁽³⁾ The cantilever sized in around 40 micron long and 15 micron wide shows a resonant frequency of 110 kHz in air and of 25 kHz in water while its spring constant of 0.1 N/m. It is higher than the resonant frequencies of the XY-Z scanner, the users can study at a maximum the effectiveness of the medium small cantilever with their AFMs. We believe that their experience must motivate to learn more about small cantilevers and that small, or perhaps smaller cantilevers penetrate the market in the near future.

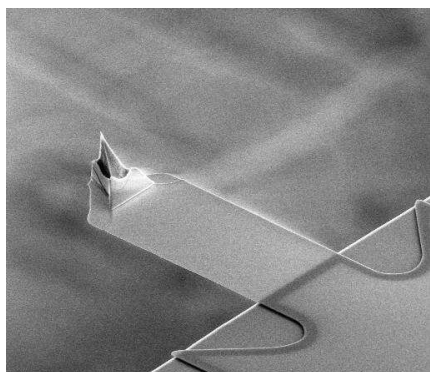


Fig.1. SEM micrograph of BioLever mini
Lever sized in 37 (L) x 16(W)
Micrometers, has a tetrahedral
Silicon tip near the free end.

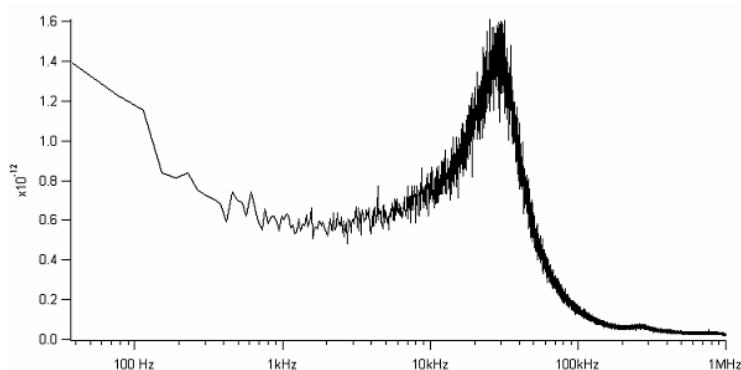


Fig.2 Thermal vibration spectrum in water
of BioLever mini. The resonant peak is
at 25 kHz.

[1] M.B.Viani et al. Nat.Struct. Biol. 7 (2000) 644

[2] T.Ando et al. PNAS 98 (2001) 12468

[3] A.Toda et al. JJAP 43, 7B (2004) 4671