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Feedback Cooling of a Massive Resonator, Quartz Tuning-fork, in Air. BAEKMAN SUNG, MANHEE LEE, WONHO JHE, Department of Physics and Astronomy, Seoul National University, Seoul 151-747, Korea, CNL TEAM — Recently, the cooling of a mechanical resonator through active feedback control has been interested for many researchers and the experiment for a cantilever cooling by using feedback control in vacuum has been done by M.Poggio et al [1]. While the recent cooling experiments have been done by tiny cantilever in vacuum, we performed the feedback cooling experiment in air by using a very massive harmonic oscillator, a tuning fork, which has been used as an useful force sensor due to its high stiffness and dynamic oscillation property in scanning probe microscopy (SPM) such as near field scanning optical microscopy, atomic force microscopy (AFM) [2]. This technique is expected to study the low temperature micro state effect of macroscopic object in air. // [1] M.Poggio, C.L.Degen, H.J.Mamim, and D.Rugar, PRL 99,017201 (2007). [2] F. J. Giessibl, S. Hembacher, M. Herz, Ch. Schiller, and J. Mannhart, Nanotechnology 15, S79 (2004).

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