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Optical Interferometry of Gas Pressure Damped Silicon Nanobridges and Nanocantilevers O. SVITELSKIY, N. LIU, V. SAUER, J. LOSBY, M. BELOV, E. FINLEY, K.M. CHENG, M. FREEMAN, W. HIEBERT, University of Alberta Physics Dept, and National Institute for Nanotechnology, Edmonton AB Canada — The growing interest in NEMS, in particular in nanobridges and nanocantilevers, is determined by the prospective of their usage as hypersensitive sensors of various physical factors: mass, tension, pressure, viscosity, etc. In order to investigate their properties under damping, a series of NEMS with different sizes was prepared from standard SOI wafers by the chemical etching after electron beam lithography. The surfaces were coated by layers of Al, Au and/or Cr in different combinations. The quality of the fabricated NEMS was evaluated by SEM imaging. The resonant frequencies of the NEMS varied in the range of 10-1000 MHz. The damping was introduced by means of pressurized gas in specially built optical pressure chamber capable to hold up to 5 atmospheres with glass window and not less than 160 atmospheres if equipped with sapphire window. We demonstrate that the NEMS Q- factor, the amplitude and the frequency of their resonances show considerable dependence on the value of the pressure in the chamber.

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