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Optical measurement of the thermal motion of a micromechanical resonator and its modal interaction by sideband actuation scheme SUNGWAN CHO, Korea Research Institue of Standards and Science, Seoul National University, MYUNG RAE CHO, SUNG UN CHO, Seoul National University, SANG GOON KIM, SEUNG BO SHIM, Korea Research Institue of Standards and Science, YUN DANIEL PARK, Seoul National University — We present measurement of the thermal motion of a micromechanical resonator and excitation of flexural mode by sideband actuation. Doubly-clamped micromechanical resonators are fabricated from high-stress silicon nitride on SiO2/Si substrate and patterned with standard e-beam lithographic techniques. Optical measurement of resonant response of micromechanical resonator reveals its fundamental flexural mode of thermal motion at approximately 3.4 MHz (f_o) with quality factor up to 180,000 and higher modes at room temperature in moderate vacuum. With fundamental and higher flexural modes of thermal motion and sideband actuation scheme, we also observe amplitude increase in flexural mode of thermal motion with blue-detuned sideband pumping.

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