Abstract Submitted
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Capacitance response and strain sensing properties of barium titanate thin film[1] SATREERAT HODAK, PAVARIT PROMSENA, Department of Physics, Faculty of Science, Chulalongkorn University, ANURAT WISITTSORAAT, Nanoelectronics and MEMS Laboratory, National Electronics and Computer Technology Center, JOSE HODAK, Department of Inorganic Analytic and Physical Chemistry, Faculty of Exact and Natural Sciences, University of Buenos Aires — Strain gauges are devices that convert mechanical stress into an electronic signal. In this research, barium titanate ($BaTiO_3$) films were deposited on flexible borosilicate glasses using a sol-gel method. Interdigitated electrodes were patterned on the films to fabricate a strain gauge. The strain gauge comprised of an array of individual coplanar capacitors on a 1.2x0.4 cm rectangular borosilicate glass of 0.16 mm thickness. A parallelogram clamp and a mechanically amplified piezoelectric actuator were used for supporting the device under test and for the application of the strain, respectively. Measurements of the strain were carried out on a cantilever beam by monitoring the changes in device capacitance and the frequency shift of an oscillator circuit. We obtained the frequency change per unit stress equal to 0.00163 MHz/MPa and the frequency change per unit strain equal to $1.038\text{x}10^{-4}$ MHz/unit strain, respectively.

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