## Abstract Submitted for the MAR14 Meeting of The American Physical Society

Dynamically Tracking the Strain Across the Metal-Insulator Transition in VO<sub>2</sub> Measured Using Electromechanical Resonators PRITESH PARIKH, CHITRALEEMA CHAKRABORTY, ABHILASH SEBAS-TIAN, SHAMASHIS SENGUPTA, Tata Institute of Fundamental Research, Mumbai, India, CHUN CHENG, JUNQIAO WU, MSE, U.C. Berkeley, MANDAR DESH-MUKH, Tata Institute of Fundamental Research, Mumbai, India — We study the strain state of doubly clamped VO<sub>2</sub> nanobeam devices by dynamically probing resonant frequency of the nanoscale electromechanical device across the metal-insulator transition. Simultaneous resistance and resonance measurements indicate M1-M2 phase transition in the insulating state with a drop in resonant frequency concomitant with an increase in resistance. The resonant frequency increases by 7 MHz with the growth of metallic domain (M2-R transition) due to the development of tensile strain in the nanobeam. Our approach to dynamically track strain coupled with simultaneous resistance and resonance measurements using electromechanical resonators enables the study of lattice-involved interactions more precisely than static strain measurements.

> Mandar Deshmukh Tata Institute of Fundamental Research

Date submitted: 15 Nov 2013

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