Abstract Submitted
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Control of the metal-insulator transition in vanadium dioxide nanobeams[1] JAE HYUNG PARK, SERKAN KASIRGA, University of Washington, JIANG WEI, Rice University, NICHOLAS NOLL, VINCENT ROMA, DAVID H. COBDEN, University of Washington, DEPARTMENT OF PHYSICS TEAM — Single-crystal nanobeams of vanadium dioxide, which are smaller than the characteristic domain size, exhibit a more reproducible and controllable metal-insulator transition (at around 67 degrees C) than bulk samples. We are exploiting this fact to perform systematic studies of the intrinsic properties of the phases involved, the phase transition, and the interphase wall, as well as to control the transition temperature. For these purposes it is necessary to have high quality crystals and to apply uniform strain. We are therefore investigating and improving the procedure of VO2 small-crystal growth by vapor phase transport, while developing experimental techniques in which thin nanobeams can be suspended across adjustable-widths gaps on silicon structures. The latter will enable application of strain purely along the tetragonal c-axis, to tune the transition, while simultaneously carrying out transport, optical and scattering measurements.

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