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Strain control and the triple point of the metal-insulator transition in vanadium dioxide nanobeams[1] JAE-HYUNG PARK, JIM COY, SERKAN KASIRGA, ZAIYAO FEI, CHUNMING WANG, BRAD SMITH, ELI BINGHAM, DAVID COBDEN, Department of Physics, University of Washington
— We have developed an apparatus for applying controlled strain to suspended nanostructures while carrying out optical measurements. This platform enables us to study phenomena which are very sensitive to strain, such as the metal-insulator transition (MIT) occuring in vanadium dioxide nanobeams. The relationship between the metallic (R) phase and the two insulating (M1 and M2) phases involved in the MIT in vanadium dioxide remains unclear. Due to the different lattice constants of these phases, control of the strain along the nanobeam allows us to study the transitions between them methodically as a function of temperature and nanobeam length. One of our findings is that the triple point of the three phases occurs at zero strain.

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