Abstract Submitted
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Effect of long-range correlations on the Metal-Insulator Transitions in Vanadium Oxides[1] GABRIEL RAMIREZ, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, SIMING WANG, Department of Physics and Center for Advanced Nanoscience, Materials Science and Engineering Program, University of California San Diego, THOMAS SAERBECK, Department of Physics and Center for Advanced Nanoscience, University of California San Diego, JEROME LESUEUR, Unité Mixte de Physique CNRS/Thales, J.E. VILLEGAS, Unité Mixte de Physique CNRS/Thales, Université Paris Sud, IVAN K. SCHULLER, Department of Physics and Center for Advanced Nanoscience, University of California San Diego — The role of long-range electronic correlations in the metal-insulator (MIT) and structural phase (SPT) transitions in V_2O_3 and VO_2 are still under debate. In order to investigate the effect of disorder on the long-range correlations we irradiated V_2O_3 and VO_2 thin films with O^+ ion at different doses. We studied the effects on the transport and crystallographic properties as a function of the temperature across the phase transition. Both materials are sensitive to the irradiation, but effects on the transport and crystallographic properties across the phase transitions are different. We find changes in the transition temperature, lattice constant and magnitude of the MIT in both oxides. We interpreted this result as a change of the long-range order in vanadium oxides by ion irradiation. The response of VO_2 and V_2O_3 to the irradiation shed light on the SPT and MIT mechanisms.

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