

Abstract Submitted  
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**Characterization of first-order phase transitions in ion-irradiated materials**<sup>1</sup> JUAN TRASTOY, YOAV KALCHEIM, JAVIER DEL VALLE, SHEENA PATEL, University of California, San Diego, JEAN-PAUL CROCOMBETTE, CEA, DEN, France, ERIC E. FULLERTON, University of California, San Diego, DAFINE RAVELOSONA, Universite Paris Sud, France, JAVIER E. VILLEGAS, Unite Mixte de Physique CNRS/Thales, France, IVAN K. SCHULLER, University of California, San Diego — First-order phase transitions englobe abrupt changes in very diverse properties (electronic, structural, magnetic, etc) and are among the most commonly studied phenomena in condensed matter physics. However, in cases like Mott transitions the responsible mechanism has not been clearly stablished. We have fabricated via sputtering deposition Mott-insulating VO<sub>2</sub> and V<sub>2</sub>O<sub>3</sub> films, as well as FeRh films. The three materials exhibit first-order electronic and structural phase transitions, in addition to a magnetic transition in the cases of V<sub>2</sub>O<sub>3</sub> and FeRh. In order to gain insight into the mechanisms involved, we have induced defects in the materials through ion irradiation and studied the effects in the phase transitions as well as physical properties like the number of carriers and the electron mobility.

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