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Charge, orbital and magnetic ordering in the bandwidth-control manganites $Pr_0.55(Ca_{1-y}Sr_y)_0.45MnO_3$ $(y = 0.15, 0.20)$ FENG YE, Oak Ridge National Laboratory, J. A. FERNANDEZ-BACA, Oak Ridge National Laboratory, PENGCHENG DAI, The University of Tennessee, S. L. LI, The University of Tennessee, YANG REN, Argonne National Laboratory, Y. TOMIOKA, Joint Research Center for Atomic Technology, Y. TOKURA, University of Tokyo
— $Pr_{0.55}(Ca_{1-y}Sr_y)_{0.45}MnO_3$ has been reported to display bicritical features near y=0.25. We have utilized neutron and synchrotron x-ray scattering techniques to study the interactions between FM, AFM and charge/orbital ordering (CO-OO) for samples with y=0.15 and y=0.20 at H=0 and in a magnetic field up to 7 Tesla. In the absence of magnetic field, both samples display insulating AFM ordered ground states. The CO-OO shows an incommensurate-commensurate transition as the temperature is lowered and the correlation lengths of the CO-OO remain much shorter than those for the AFM ordering at all temperatures. With the application of a magnetic field there is a sharp first-order like transition from the CO-OO insulating phase to a metallic ferromagnetic state. This work was supported by the US DOE under Contract No. DE-AC05- 00OR22725 with UT-Batelle, LLC and by U.S. NSF DMR-0139882.

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