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Phase Separation in Ferromagnetic/Charge-ordered Superlattices T. ZAC WARD, University of Tennessee, JIANXING MA, University of Tennessee, DANE GILLASPIE, Unversity of Tennessee, HONG-YING ZHAI, ORNL, E. WARD PLUMMER, University of Tennessee, JIAN SHEN, ORNL — The coexistence of ferromagnetic metal (FFM) and charge-ordered insulator (COI) observed in manganites, such as $La_{5/8-y}Pr_yCa_{3/8}MnO_3$, has been an intensive focus in the study of transition metal oxides (TMO). Theories related to structural nanoscale disorder of charge carrier dopants and self-organization caused by an intrinsic elastic energy landscape have been proposed. To understand the subtle balance and competition between the different electronic phases, we have grown $La_{5/8}Ca_{3/8}MnO_3/Pr_{5/8}Ca_{3/8}MnO_3$ superlattices with different stacking periods in order to control the chemical ordering of La/Pr ions and thus the elastic energy landscape. The magnetic and transport properties of FM/CO superlattices as well as La/Pr disordered $La_{5/16}Pr_{5/16}Ca_{3/8}MnO_3$ will be presented and the driving mechanism of FM/CO phase separation will be discussed. Research sponsored by the U. S. Department of Energy under contract DE-AC05-00OR22725 with the Oak Ridge National Laboratory, managed by UT-Battelle, LLC

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