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Probing non-collinear magnetism in $Ca_{1-x}Sr_xMn_7O_{12}$ films by neutron scattering AMANDA HUON, Drexel University, ALEXANDER GRUTTER, BRIAN KIRBY, STEVEN DISSELER, JULIE BORCHERS, National Institute of Standards Technology, YAOHUA LIU, WEI TIAN, ANDREAS HERKLOTZ, HO NYUNG LEE, MICHAEL FITZSIMMONS, Oak Ridge National Laboratory, STEVEN MAY, Drexel University — $CaMn_7O_{12}$ has been reported to be a single-phase multiferroic quadruple manganite that exhibits both ferroelectricity and helical magnetism below 90 K, but presently no experimental data from bulk or thin films have demonstrated coupling between these two ordering types. Herein, we synthesized epitaxial $Ca_{1-x}Sr_xMn_7O_{12}$ thin films grown by oxide molecular beam epitaxy and pulsed laser deposition. We utilized neutrons to map out the non-collinear magnetic wavevectors as a function of temperature. To verify whether this coupling is present in our thin films we performed both magnetic and electric field studies. The results highlight the scientific opportunities in using chemical pressure and strain to modify non-collinear magnetism and better understand the link between ferroelectricity and helical magnetism. *This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Workforce Development for Teachers and Scientists, Office of Science Graduate Student Research (SCGSR) program. The SCGSR program is administered by the Oak Ridge Institute for Science and Education for the DOE under contract number DE-SC0014664.*

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