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Origin of Electric Field Induced Magnetization in Multiferroic $HoMnO_3$ B.G. UELAND, J.W. LYNN, NIST Center for Neutron Research, National Institute of Standards and Technology, M. LAVER, Department of Materials Science and Engineering, University of Maryland, Y.J. CHOI, S.W. CHEONG, Rutgers Center for Emergent Materials and Department of Physics & Astronomy, Rutgers University — We have performed polarized and unpolarized small angle neutron scattering experiments on single crystals of $HoMnO_3$ and have found that an increase in magnetic scattering at low momentum transfers begins upon cooling through temperatures close to the spin reorientation transition at $T_{SR} \approx 40$ K. We attribute the increase to an uncompensated magnetization arising within antiferromagnetic domain walls. Polarized neutron scattering experiments performed while applying an electric field show that the field suppresses magnetic scattering below $T \approx 50$ K, indicating that the electric field affects the magnetization via the antiferromagnetic domain walls rather than through a change to the bulk magnetic order. http://arxiv.org/abs/0909.0198v1

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