Abstract Submitted
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X-ray resonant magnetic scattering study of multiferroic RMnO$_3$(R = Dy, Ho, Er) compounds A.I. GOLDMAN[1], S. NANDI[1], A. KREYSSIG[1], L. TAN[1], J.W. KIM[1], J.Q. YAN[1], M.D. VANNETTE[1], J.C. LANG[3], D. HASKEL[3], T.A. LOGRASSO[2], R.J. MCQUEENEY[1], [1] Dept. of Physics and Astronomy, Iowa State University, Ames; [2]Ames Laboratory US DOE, Ames ;[3]Advanced Photon Souce, Argonne — Element specific x-ray resonant magnetic scattering (XRMS) investigations were undertaken to determine the magnetic structure of multiferroic hexagonal RMnO$_3$ compounds. In the intermediate temperature phase (ITP) (8-68 K for the Dy^{3+} and 4.5-40 K for Ho^{3+}) the moments are aligned and antiferromagnetically correlated in the **c** direction according to the same magnetic representation Γ_3. Below the ITP, the Dy^{3+}/Ho^{3+} moments order differently and according to the magnetic representations Γ_2/Γ_1. The temperature dependence of the observed intensity in the ITP can be modeled assuming the splitting of ground-state doublet/quasi-doublet crystal-field levels of Dy^{3+}/Ho^{3+}by the exchange field of Mn^{3+}. No resonant signals could be found for Er^{3+} from 2-80 K. Specific magnetic representations can be excluded for the magnetic order of Er^{3+} moments but can not be uniquely determined within the sensitivity of XRMS. – The support by U.S. DOE (DE-AC02-07CH11358 and DE-AC02-06 CH11357) is acknowledged.

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