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On the Nature of the Ferroelectric Transition in Multiferroic Hexagonal $REMnO_3$ TREVOR TYSON, TAO WU, HAIYAN CHEN, NJIT, JAINMING BAI, University of Tennessee, SANG-WOOK CHEONG, Rutgers University — Combined local and long range structural measurements were conducted on $REMnO_3$ for temperatures extending significantly above the ferroelectric transition temperature (T_{FE}). We find in hexagonal REMnO3 no large atomic (bond distance or thermal factors) or electronic structure changes on crossing T_{FE}. The born effective charge tensor is found to be highly anisotropic at the O sites indicating very strong hybridization of the charge. The tensor does not change significantly above T_{FE} revealing no charge redistribution and suggests an unusual transition. This work is supported by DOE Grants DE-FG02-07ER46402 (NJIT) and DE-FG02-07ER46382 (Rutgers University).

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