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Critical Structural Parameters Influencing Magnetic Transition Temperatures in Multiferroic Hexagonal $RMnO_3$[1] TREVOR TYSON, TIAN YU, TAO WU, Department of Physics, New Jersey Institute of Technology, Newark, NJ 07102, CATHERINE DUBOURDIEU, 2INL, CNRS - Ecole Centrale de Lyon,Ecole Centrale de Lyon, 36 avenue Guy de Collongue, 69134 Ecully, SANG-WOOK CHEONG, Rutgers Center for Emergent Materials and Department of Physics and Astronomy & Rutgers University, Piscataway, NJ 08854 — Multiferroic hexagonal $RMnO_3$ systems with a broad range of transition temperatures and including some with spin rotation transitions have been studied. Detailed temperature depended structural measurements have been conducted to extract the static and dynamic changes. The structural measurements are combined with qualitative theoretical arguments to determine the critical parameters which influence the magnitude of the magnetic ordering temperature. Suggestion are made on ways to optimize it to enable higher temperature multiferroic behavior.

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