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Long range order beyond vortices in h-REMnO₃ SEUNG CHUL CHAE, NARA LEE, YOICHI HORIBE, SANG-WOOK CHEONG, Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey 08854, USA — Fascinating vortices were discovered recently in ferroelectric domain patterns in hexagonal (h)-YMnO₃. One of the important ingredients for these vortex domain patterns is mutual interlocking of ferroelectric and structural antiphase domain walls. In contrast to expected vortex domain patterns, we have found intriguing stripe domain patterns in other h-REMnO₃ (RE=Ho, Er, Tm, Yb, Lu). These stripe domain patterns appear to indicate the presence of long-range-ordered state as the true ground state in h-REMnO₃. On the other hand, vortex domain patterns suggest the presence of a Kosterlitz-Thouless-like transition. We argue that this significant difference stems from very slow kinetics associated the ordering of six possible degrees of freedom.

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