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Magnetic Symmetry of Two-Dimensional Multiferroics AVADH SAXENA, TURAB LOOKMAN, Los Alamos National Lab — Hexagonal rare earth manganites are multiferroic materials which exhibit triangular antiferromagnetic ordering in the basal plane which can be characterized by two-dimensional (2D) magnetic symmetry. Reduced dimensionality is also desirable for achieving large (usually nonlinear) magnetoelectric coupling at higher temperatures. Indeed, the magnetization in BaMnF_4 orders two dimensionally below the transition temperature with a change in the b-axis dielectric constant. Moreover, there can be phase transitions between different 2D magnetic phases. From this perspective we study two dimensional magnetic (or color) symmetry, enumerate 2D magnetic space groups and illustrate their role in multiferroic phase transitions.

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