

Abstract Submitted
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Magnetoelectric Chains: Quasi-One-Dimensional Multiferroics

TURAB LOOKMAN, AVADH SAXENA, Los Alamos National laboratory — Recently discovered pyroxenes represent an example of a multiferroic containing quasi-one dimensional (Q1D) building blocks of zig-zag chains of edge-sharing octahedra along the c-axis of the crystal. This leads us to the natural question: what types of Q1D symmetries would allow for the simultaneous presence of polarization and magnetization? Moreover, what kinds of phase transitions can exist between two different Q1D magnetic phases? From this perspective we study quasi-one-dimensional magnetic symmetry in 3D space (magnetic rod groups), enumerate Q1D magnetic point groups that allow for magnetoelectricity and illustrate their role in low-dimensional multiferroic phase transitions.

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