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High Magnetic Tunability of Dielectric Properties in Magnetically-Driven Ferroelectricity SANG-WOOK CHEONG, S. PARK, Y. J. CHOI, C. L. ZHANG, S. GUHA, Rutgers Center for Emergent Materials and Department of Physics & Astronomy, Rutgers, Piscataway, NJ 08854 — Lattice relaxation in magnetically-ordered states with broken inversion symmetry through exchange-striction can induce non- centrosymmetric lattice distortions, leading to the presence of electric polarization. In these magnetically-driven ferroelectrics, dielectric properties turn out to be highly susceptible to applied magnetic fields. Both symmetric and antisymmetric exchange coupling can be involved in the exchange-striction. Magnetically-driven ferroelectrics with the symmetric coupling are associated with acentric spin density wave (SDW) states, and the antisymmetric coupling, relevant to the Dzyaloshinskii-Moriya-type interaction, becomes active when ferroelectricity is induced by spiral magnetic orders. A few examples of magnetically-driven ferroelectrics, exhibiting high tunability of dielectric properties in magnetic fields, will be discussed.

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