

Abstract Submitted
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Unified model for spin order induced polarization in multiferroics

HONGJUN XIANG, Fudan University — The microscopic origins of ferroelectricity in different multiferroic systems were theoretically investigated. We proposed a unified model [1,2] which includes purely electronic and ion-displacement contribution simultaneously to describe spin-order induced ferroelectricity. An efficient method [3] was developed to compute the model parameters from first-principles. On the basis of the unified model and density functional calculations, we explained the ferroelectricity induced by the proper-screw spin spiral [2], discovered a novel magnetoelectric coupling mechanism in which the magnitude of the polarization is governed by the exchange striction with the direction by the spin chirality [4], proposed that the ferroelectricity in the chiral-lattice magnet Cu₂OSeO₃ is due to the unusual single-spin site term [5], unraveled that the magnetoelectric effect observed in BiFeO₃ originates from the exchange striction [2].

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