

Bragg coherent diffractive imaging of one-dimensional topological strings in multiferroic barium hexaferrite nanocrystals

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Studies of topological strings is important both for condensed matter physics and cosmology, where they share the universality class with cosmic strings. Until recently these studies were bound to the surface phenomena or to destructive studies where layers of material were removed and imaged, thus preventing researchers to look into time-dependent behavior. We combined group-theoretical analysis, first-principle density functional calculations, Landau phase-field theory and Bragg coherent diffractive imaging technique at synchrotron light source to visualize and interpret three-dimensional distribution of topological strings in barium hexaferrite nanoparticle under applied external electric field. We expect that our results will be used in future experiments on topological defects in many condensed matter systems where volumetric information is of critical importance.

Position

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