

Abstract Submitted
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Ferroelectric domain topology of the multiferroic spin spiral system MnWO_4 ¹ D. MEIER, TH. LOTTERMOSER, G. YUAN, M. FIEBIG, HISKP - Univ. Bonn, Germany, P. BECKER, L. BOHATY, Institute of Crystallography, Univ. Cologne, Germany — The strong interest in magnetoelectric multiferroics is due to their potential concerning the design of novel multifunctional devices, as well as to their unusual physical properties. Among these, TbMnO_3 , $\text{Ni}_3\text{V}_2\text{O}_8$, and MnWO_4 form a particularly challenging group: The key factor for ferroelectricity lies in the long-wavelength magnetic order. Many aspects of the precise nature of the ferroelectric state in such a *spiral magnet*, and in particular their coupling to the magnetic order, are still largely unclear. Here we report about the three-dimensional spatial distribution of ferroelectric domains in MnWO_4 , revealed by optical second harmonic generation (SHG). Although ferroelectricity is induced by cycloidal spiral magnetic order, 180° domains as in a conventional ferroelectric are observed. Their coupling to the coexisting magnetic order and modifications of this coupling by external parameters such as temperature variation are discussed using spatially resolved SHG for probing both the magnetic and the ferroelectric order in one experimental run.

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