

Progress and perspectives on imaging ferroic domain structures with dark-field x-ray microscopy

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The sensitivity of dark-field x-ray microscopy (DF-XRM) to subtle strains lattice tilts makes it ideally suited for the mapping and characterization of ferroelectric and ferroelastic domains. Furthermore, the relative ease with which electric fields and/or temperature changes can be applied allows for the study of such domain patterns under driven conditions, while the ability to sample embedded volumes means that measurements can be made without the potentially spurious effects of the sample surfaces. I will present an overview of our successes and failures in characterizing ferroic domain structures, discuss the current challenges facing the continued use of this technique for such studies, and speculate on how DF-XRM may be further improved in the future.