

MA 16: Invited Talk Lottermoser

Time: Wednesday 9:30–10:00

Location: HSZ 04

Invited Talk

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Nonlinear optics on spin-spiral multiferroics — •THOMAS LOTTERMOSER — HISKP, Universität Bonn, Bonn, Deutschland

Induced multiferroics (MF) in which a spin spiral induces a spontaneous ferroelectric (FE) polarization have reached high experimental and theoretical interest. This is mainly due to the complex and pronounced interaction between the magnetic and electric structure. In spite of the vast research activity a lot of questions about the precise nature of spin-spiral MFs remain unanswered. In particular the nature of the induced FE polarization is not understood in detail.

Optical second harmonic generation (SHG) will be presented as tool to get a deeper understanding of spin-spiral MFs. SHG is sensitive

to symmetry and therefore an ideal tool for investigating coexistence and interaction of different types of ferroic order with a single technique. Together with high spatial resolution this allows, for example, the investigation of properties and coupling of ferroic domains.

As examples results on MnWO_4 , DyMnO_3 and TbMn_2O_5 will be presented. All materials exhibit SHG signals up to six orders of magnitude larger than conventional FEs. This points to an electronic rather than an ionic nature of the induced polarization because SHG couples more efficiently to the electronic system than to ionic distortions. In addition results on the ferroic domain properties and the control of magnetic domains by electric fields and electric domains by magnetic fields will be presented.