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【174】 Quantum Mechanical Simulations of sub-atomic resolution differential phase contrast imaging of magnetic materials

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In recent years it has been shown that electric fields in solids can be imaged, with sub-atomic resolution, using scanning transmission electron microscopy (STEM) and differential phase contrast imaging techniques. Here we use a Pauli equation based multislice method [Phys. Rev. Lett. **116**, 127203 (2016)] to investigate the possibilities of imaging also microscopic magnetic fields with such STEM techniques. Considering an example of a hard ferromagnetic material FePt, We illustrate how sub-atomic resolution images of the microscopic magnetic fields can be extracted for thin samples and suitable electron beam conditions. We discuss related possibilities and limitations, and aspects regarding data interpretation.

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