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Inverse Transition of Magnetic Domain Patterns in Ultrathin Fe Films on Cu(001): A Quantitative Analysis OLIVER PORTMANN, ALESSANDRO VINDIGNI, TUOMAS KNOWLES, ANDREAS VATERLAUS, DANILO PESCIA, Laboratory for Solid State Physics, ETH Zurich — The magnetization of ultrathin Fe films on Cu(001) is perpendicular to the film plane. Due to the competition between exchange and dipolar interactions such films break up into domains of opposite magnetization. As the temperature is increased, the magnetic domain pattern undergoes an inverse transition¹: a more ordered stripe phase is found at higher temperatures than a less ordered labyrinthine phase. The domain structure has been imaged by means of a SEMPA (Scanning Electron Microscope with Polarization Analysis). We characterize this pattern sequence quantitatively in terms of domain width, correlations, single-configuration energy and density of defects, directly extracted from SEMPA images.

¹ O. Portmann, A. Vaterlaus, and D. Pescia, *Nature* **422**, 701 (2003).

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