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Chemical Segregation in GdFeCo: An X-ray view on Magnetic Coercivity ALEXANDER REID, SLAC National Accelerator Laboratory, CATHERINE GRAVES, BENNY WU, Dept. of Applied Physics, Stanford University, TIANHAN WANG, Stanford Institute for Materials and Energy Science, Stanford University, ALEXEY KIMEL, ANDREI KIRILYUK, Radboud University Nijmegen, The Netherlands, ARATA TSUKAMOTO, A. ITOH, Nihon University, Japan, JOACHIM STÖHR, SLAC National Accelerator Laboratory, THEO RASING, Radboud University Nijmegen, The Netherlands, HERMANN DÜRR, ANDREAS SCHERZ, SLAC National Accelerator Laboratory — The magnetic coercivity in intermetallic alloys is known to be dominated by microscopic inhomogeneities. These control the characteristics of magnetic switching as they provide nuclei for magnetic domain formation, and the pinning sites governing domain wall propagation. However, such regions exist on nanometer length scales with weak magnetic contrast to their surroundings; their characterization has therefore remained illusive. Here we demonstrate how resonant x-ray scattering is intrinsically sensitive to magnetic changes in a segregated phase. We utilizes the fact that magnetic scattering asymmetry directly probes regions where this phase segregation occurs. Our measurements on GdFeCo show strongly temperature dependant magnetic canting in the segregated regions due to local changes in magnetic anisotropy. Understanding the origin and importance of these chemically segregated regions will allow a better understanding of the magnetic switching process in GdFeCo.

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