

Abstract Submitted  
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**Measuring the Magnetic Induction of Isolated CoFeB Nanowires by Off-Axis Electron Holography** AZADEH AKHTARI-ZAVAREH, Simon Fraser University (SFU), T. KASAMA, Technical U of Denmark, L.P. CARIGNAN, École Polytechnique de Montréal (EPM), A. YELON, D. MÉNARD, EPM, R. HERRING, University of Victoria, R.E. DUNIN-BORKOWSKI, Research Centre Jülich, M.R. MCCARTNEY, Arizona State University, K.L. KAVANAGH, SFU — Soft, and high saturation magnetization CoFeB Ferromagnetic Nanowires with diameters of 40 nm and 170 nm, were studied by *Selected Area Electron Diffraction (SAED)* and Electron Holography (EH). Diffraction patterns obtained from the nanowires suggest that the wires are nanocrystalline rather than amorphous. Holograms show the magnetization inside the wire is uniform over most of the wire length, except at the edge. Since the wires consist of soft magnetic nanocrystals, the magnetic anisotropy is likely dominated by the shape anisotropy. Numerical simulations suggest that the stray fields at the top of the wire are well reproduced by a truncated cone model, rather than a cylinder. The measured magnetic induction for wires with diameters near 170 nm is 1.45 T, which is somewhat smaller than the saturation magnetization extracted from static magnetometry measurements of thin films of CoFeB (about 1.67 T). For the 40 nm diameter wires the magnetic induction is ranging from an average of 0.5 T near the tip of the wires to 1.5 T in the middle of the wires. The smaller induction near the end of the wires is attributed to the presence of a significant *out-of-plane* magnetic component since their tips are generally pointed out of the plane of the sample holder.

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