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Enhanced hyperfine magnetic fields for face-centered tetragonal Fe(110) ultrathin films on vicinal Pd(110) BEATRIZ ROLDAN CUENYA, Physics Department, University of Central Florida, Orlando, FL 32816, USA, WERNER KEUNE, Institut fr Physik, Universitt Duisburg-Essen (Campus Duisburg), D-47048 Duisburg, Germany, DONGQI LI, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, USA, SAM BADER, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, USA — The structure and hyperfine magnetic properties of epitaxial Fe ultrathin films on a vicinal Pd(110) surface have been investigated by means of Low Energy Electron Diffraction (LEED), Reflection High Energy Electron Diffraction (RHEED) and ^{57}Fe Conversion Electron Mössbauer Spectroscopy (CEMS). LEED and RHEED provide evidence for initial pseudomorphic film growth. The RHEED determination of the in-plane atomic distance versus Fe film thickness demonstrates the stabilization of the metastable fcc-like Fe structure on Pd(110). This interpretation is supported by *in-situ* ^{57}Fe CEMS measurements which indicate an enhanced saturation hyperfine field of $\approx$ 39T for a 3 monolayers thick Fe film at 25 K. This is the highest value ever measured for Fe on a metallic substrate. Our results suggest that ultrathin fcc-like (face-centered tetragonal) Fe films on Pd(110) are in a ferromagnetic high-moment state, and show a considerably enhanced Fe magnetic moment due to electronic $3d$-$4d$ hybridization at the Fe/Pd interface.

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