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Layer Resolved Imaging of Magnetic Domain Motion in Epitaxial Heterostructures SIOAN ZOHAR, YONGSEONG CHOI, Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois 60439, USA, DAVID LOVE, RHODRI MANSELL, CRISPIN BARNES, Cavendish Laboratory, University of Cambridge, J J Thomson Avenue, CB3 0HE Cambridge, United Kingdom, DAVID KEAVNEY, RICHARD ROSENBERG, Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois 60439, USA — We use X-ray Excited Luminescence Microscopy (XELM) to image the elemental and layer resolved magnetic domain structure of an epitaxial Fe/Cr wedge/Co heterostructure in the presence of large magnetic fields. The observed magnetic domains exhibit several unique behaviors that depend on the Cr thickness (tCr) modulated interlayer exchange coupling (IEC) strength. For Cr thickness tCr?<?0.34?nm and tCr?>?1.5?nm, strongly coupled parallel Co-Fe reversal and weakly coupled layer independent reversal are observed, respectively. The transition between these two reversal mechanisms for 0.34?<?tCr?<?1.5?nm is described by a combination of IEC guided domain wall motion and stationary zig zag domain walls. We observe domain walls nucleated at switching field minima are guided by IEC spatial gradients and collapse at switching field maxima.

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