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## **Imaging magnetization reversal in perpendicular exchange coupled AFM/FM systems by soft x-ray holography\***

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We have used soft x-ray holography for imaging layered systems composed of ferromagnetic (FM) [Co/Pt]<sub>n</sub> multilayers with perpendicular anisotropy exchange-coupled to antiferromagnetic (AFM) IrMn and FeMn films. X-ray absorption spectra were obtained by recording simultaneously the total electron yield and the transmitted photon intensity. The spectroscopic analysis reveals the presence of uncompensated AFM moments localized at the AFM/FM interface, which are aligned parallel to the FM ones. The element-specific magnetic imaging was performed by tuning circularly polarized light to the energy of the different  $L_3$  absorption edges and recording the holography patterns formed when shining this coherent beam through a multiple reference hole sample-mask structure. Our results provide direct evidence at nanometer scale and upon application of external magnetic fields of the magnetization reversal behavior of perpendicular exchange-coupled FM/AFM systems as well as its asymmetric nature.

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