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Interface coupling between ferromagnets and random and dilute antiferromagnets[1] DAVID LEDERMAN, KINESHMA MUNBODH, MIYEON CHEON, West Virginia University, Morgantown, WV 26506-6315, M.R. FITZSIMMONS, Los Alamos National Laboratory, Los Alamos, NM 87545, NEIL R. DILLEY, Quantum Design, Inc., San Diego, CA 92121 — Depth profiles for pinned and unpinned magnetizations were determined across the interface between a ferromagnet (F) and random and dilute antiferromagnets (RAF and DAF) exemplified by $Fe_{0.45}Ni_{0:55}F_2$/Co and $Fe_{0:34}Zn_{0:66}F_2$/Co bilayers, respectively, using polarized neutron reflectivity (PNR). PNR measurements were complemented by magnetometry using applied fields as large as 160 kOe to assure saturation of the entire sample, including magnetic moments that are normally pinned at lower fields. The locations of pinned and unpinned magnetization in the ferro- and antiferromagnets were identified. The origin of exchange bias in the RAF system is noticeably different than that of the DAF system. In the RAF system, a domain wall is formed at the RAF/F interface when the ferromagnet's magnetization is reversed. In the DAF system, some domains within the bulk of the DAF are reversed upon reversal of the ferromagnet with others remaining pinned, while the interface magnetization is entirely reversed. This work was supported by the National Science Foundation.

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