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The influence of magnetic domain landscape on the flux pinning in ferromagnetic/superconducting bilayers MARTA Z. CIEPLAK, Z. ADAMUS, Institute of Physics, PAS, Warsaw, Poland, M. KONCZYKOWSKI, Ecole Polytechnique, Palaiseau, France, L. Y. ZHU, C. L. CHIEN, Johns Hopkins Univ. — A line of miniature Hall sensors has been used to study the influence of the disorder in the magnetic domain landscape on flux pinning in the ferromagnetic/superconducting (F/S) bilayers. The bilayers consist of Nb as the S layer and Co/Pt multilayer with perpendicular magnetic anisotropy as the F layer, separated by a Si buffer layer to avoid the proximity effect. By changing of the Pt layer thickness, the magnetic domain landscape with different degree of disorder, ranging from uniformly distributed narrow domains (quasi-ordered landscape) to highly disordered landscape with domains of different sizes, can be predefined in the F layer. The flux behavior is then measured in the superconducting state using the Hall sensors. It is found that the quasi-ordered landscape with domains width comparable to the magnetic penetration depth produces large enhancement of the vortex pinning and smooth flux penetration. The more disordered magnetic domain patterns cause less pinning and create large edge barrier for vortex entry followed by strongly inhomogeneous flux penetration. The possible origins of this behavior will be discussed.

Marta Z Cieplak
Institute of Physics, PAS, Warsaw

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