Abstract Submitted
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Flux penetration in a ferromagnetic/superconducting bilayer utilizing perpendicular magnetic anisotropy[1] MARTA Z. CIEPLAK, Z. ADAMUS, A. ABAL'OSHEV, M. BERKOWSKI, Inst. of Physics, PAS, M. KONCZYKOWSKI, Ecole Polytechnique, Palaiseau, France, X. M. CHENG, L. Y. ZHU, C. L. CHIEN, Johns Hopkins University — The Hall sensor array is a useful tool for measuring local magnetic fields. An array of miniature Hall sensors has been used to study the flux penetration in a ferromagnetic/superconducting (F/S) bilayer consisting of Nb as the S layer and Co/Pt multilayer with perpendicular magnetic anisotropy as the F layer, separated by an amorphous Si layer to avoid proximity effect. The F layer is first premagnetized to different magnetization reversal stages to obtain various magnetic domain patterns. The effect of these domain patterns on the flux behavior in the S layer is then studied at various temperatures in the superconducting state. We have observed that, in addition to the vortex pinning enhancement, some domain patterns strongly increase the first penetration field and induce large thermomagnetic instabilities (flux jumps), which are not detectable by magnetometry. We also discuss the profiles of the flux distribution across these F/S bilayers.

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