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Study of Inverse Proximity Effect in Ferromagnet/ Superconductor Bilayers Using a Sagnac Interferometer[1] JING XIA, Stanford University, A. PALEVSKI, Tel Aviv University, A. KAPITULNIK, Stanford University — It was recently proposed theroretically that ferromagnetic order can be induced in the superconductor in a ferromagnet/superconductor (S/F) bilayer structure through a so called inverse proximity effect. The proposal predicts a sizable magnetic moment in the "S" layer that couples antiferromagnetically to the moment in the "F" layer due to Cooper pairs near the interface formed with one electron in the F layer and one in the S layer. The induced magnetic moment is expected to penetrate the superconductor over a size of the Cooper pairs, i.e. ξ_s. In order to directly test this interesting scenario, we fabricated Ni/Pb and Ni/Al bilayer samples and probed the possible induced magnetic moments in the "S" layer through high resolution Surface Magneto Optical Polar Kerr Effect (PKE) measurements on the "S" layer side through the bilayer's T_C using a Sagnac interferometer. The thickness of the "S" layer was fabricated to be larger than the optical skin depth in order to make sure that our experiment doesn't pickup up any magnetic moment from the "F" layer. ξ_s dependence of the effect is studied by comparing the results in Ni/Pb and Ni/Al samples.

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