Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Proximity effect in MgB_2-Permalloy hybrid system[1] APRIL O'BRIEN, JIYEONG GU, Department of Physics and Astronomy, California State University, Long Beach — Recently ferromagnet/superconductor systems have attracted a great attention due to their scientific interest and potential for the technological application. So far, most of the work has been done for Nb with ferromagnetic metals or high temperature oxide superconductors with magnetic oxides. In this presentation we will discuss the proximity effect in magnesium diboride (MgB_2)/Py thin films, where the superconducting property changes due to the adjacent Py layer. Even though the good electronic properties such as large critical current density and large coherence length of MgB_2 make it a good candidate for superconducting electronic applications, depositing a good-quality *in-situ* MgB_2 thin film is still challenging. Especially for the multilayer deposition, it is ideal to deposit all the layers *in-situ* without *ex-situ* treatment. We used a sputtering to deposit the MgB_2 layer *in-situ* and made a hybrid system with Py. We found that the substrate temperature during the MgB_2 deposition is the most important parameter to determine the superconducting transition temperature of the sample. In addition to the proximity effect we will also discuss the problem with a sputtering method for MgB_2 deposition.

[1]This project is supported by Research Corporation Grant #CC6756 and NSF MRI Grant #0619909.

April O'Brien
Dept. of Physics and Astronomy, California State University, Long Beach

Date submitted: 02 Dec 2007 Electronic form version 1.4