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**Vortex dynamics in ferromagnetic / high  $T_c$  superconducting heterostructures** N. HABERKORN, J. KIM, M. MIURA, B. MAIOROV, P. DOWDEN, L. CIVALE, Superconductivity Technology Center, Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA — In this work we explore the influence of the ferromagnetic landscape generated by magnetic phase separation in manganites on the vortex pinning of HTS/FM heterostructures. We have grown  $\text{Gd}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$  (GCMO),  $\text{Y}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$  (YCMO) and YBCO films, as well as GCMO/YBCO and YCMO/YBCO bilayers by Pulsed Laser Deposition. GCMO is a ferrimagnetic material with Curie temperature of  $\sim 80$  K and a compensation temperature of 15 K, whereas YCMO is ferromagnetic with Curie temperature  $\sim 80$  K. In both materials the saturation magnetization is smaller than the value expected from ferrimagnetic and ferromagnetic order, suggesting phase separation with small ferromagnetic domains. The magnetic domain size as a function of temperature for the magnetic films was investigated using magnetic force microscopy (MFM). We will present a comparison of the vortex pinning and dynamics in the YBCO single layers and the GCMO/YBCO and YCMO/YBCO bilayers that allows us to identify the temperature and field regimes where magnetic pinning is effective.

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