Abstract Submitted for the PSF09 Meeting of The American Physical Society

Magnetic losses, critical currents and pinning in coated conductors¹ ANOTA IJADUOLA, Monmouth College, JAMES THOMPSON, DAVID CHRISTEN, R. FEENSTRA, A. GOYAL, C.L.H. THIEME, K.R. MARKEN — The discovery of high temperature superconductors (HTS) in particular $YBa_2Cu_3O_{7-\delta}$ (YBCO) ($T_c \approx 92$ K), sparked great interest in the use of HTS materials in practical applications such as transmission lines, motors and generators. Different techniques are used to fabricate these 'coated conductors' from YBCO and other HTS. Ferromagnetic losses arise from the substrates that are used in the fabrication processes. I will talk about the studies we have done on these losses and also discuss the critical current (J_c) that flow in these coated conductors. On the other hand, exposing a type II superconductor to magnetic field generates vortices which are detrimental to the current carrying capabilities. These vortices have to be pinned (made immobile) in order to have significant and useful J_c flow in these conductors. I will discuss the different pining mechanisms used in these coated conductors and particularly focus on the pinning features we studied on some set of YBCO thin films.

¹Work supported by AFOSR and the USDOE through the ORNL.

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Date submitted: 12 Oct 2009

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