

Abstract Submitted  
for the SES15 Meeting of  
The American Physical Society

**Effects of substrate on the superconducting properties and ferromagnetic loss in RABiTS coated conductors**<sup>1</sup> ANOTA IJADUOLA, University of North Georgia, Dahlonega GA 30597, C. L. H. THIEME, M. W. RUPICH, American Superconductor Corp., Westborough, MA 01581, USA, A. GOYAL, Oak Ridge National Laboratory, Oak Ridge TN 37831 — Given the substantial progress in the fabrication of coated conductors, considerable attention is now being directed to studying and understanding the ferromagnetic loss that arise from the substrates. Rolling Assisted Biaxially Textured Substrates (RABiTS) coated conductors (CC) use alloys of NiW as the preferred substrate during fabrication. In this work, we have made magnetic measurements on a set of RABiTS CC with different composition of NiW alloy in order to determine the amount of ferromagnetic loss from the substrates. We also report on the magnetometric studies of the critical current density  $J_c$  flowing in the thin  $YBa_2Cu_3O_{7-\delta}$  (YBCO) films that were deposited on these substrates. The  $J_c$  were determined both as a function of applied field  $H$  and temperature  $T$ . Isothermal magnetization loops  $M(H;T)$  and remanent magnetization  $M_{rem}(T)$  in zero applied field  $H = 0$ , were measured with  $H$  parallel to the  $c$  axis (i.e., normal to film plane). For a wide range of temperatures and intermediate fields, we find a power law falloff  $J_c \propto H^{-\beta}$  with  $\beta \sim (0.56 - 0.69)$  for all materials. For higher temperatures approaching the irreversibility line, we find  $J_c(T, sf) \propto (1 - T/T_c)^n$  with  $n \sim 1.1 - 1.3$ .

<sup>1</sup>This work was supported in part by the U.S. Department of Energy, Office of Science, Office of Workforce Development for Teachers and Scientists (WDTS) under the VFP

Anota Ijaduola  
University of North Georgia

Date submitted: 13 Oct 2015

Electronic form version 1.4