

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Enhanced Flux Pinning in YBCO Films by Nano-Scaled Substrate Surface Roughness QIANG LI, ZUXIN YE, WEIDONG SI, YUFENG HU, Brookhaven National Laboratory — Nano-scaled substrate surface roughness is shown to strongly influence the critical current density (J_c) in YBCO films, We prepared high quality c-axis oriented YBCO thin films by pulsed laser deposition on the single crystal LaAlO_3 substrates consisting of two separate twin-free and twin-rich regions. The nano-scaled corrugated substrate surface was created in the twin-rich region during the deposition process. Using magneto-optical imaging techniques coupled with optical and atomic force microscopy (AFM), we observed an enhanced flux pinning in the YBCO films in the twin-rich region, corresponding to $\sim 30\%$ increase in J_c . This result suggests that some nano-scaled substrate surface roughness may be beneficial for increasing J_c in YBCO coated conductors.

Qiang Li
Brookhaven National Laboratory

Date submitted: 23 Nov 2004

Electronic form version 1.4