

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Twins, Their Microstructure and Correlation to Critical Current Densities in Superconducting Melt-Textured Grown Y-Ba-Cu-O** SIU-WAI CHAN, Columbia University, LINFENG MEI, Columbia University, APPLIED PHYSICS TEAM — Refinement of twin microstructure in melt-textured grown (MTG) Y-Ba-Cu-O (YBCO) is engineered by annealing at different temperatures. This isothermal method exploits the temperature dependence of twin-boundary-energy. The twin boundary energy is obtained by two independent methods: (1) twin spacing and (2) twin-tip shape. The twin boundary energy measurement is accomplished with transmission electron microscopy. Refinement of twin spacing with increasing temperature is confirmed. Twin spacing decreases from 190 nm to 54 nm as the temperature increases from 450 to 680°C. Critical current measurements support that a sample with a higher density twin density often results in a higher pinning-force i.e.  $3.4 \times 10^8 \text{ N/m}^3$  versa  $1.2 \times 10^8 \text{ N/m}^3$ .

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Date submitted: 30 Nov 2005

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