

2 Films Fabricated by *Ex Situ* Annealing of CVD-Grown B Films in Mg Vapor

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Clean Epitaxial MgB MINA HANNA, The University of Houston, SH-UFANG WANG¹, ANDREW DAVID ECK, RUDEGER WILKE, KE CHEN, ARSEN SOUKIASSIAN, CHE-HUI LEE, WENQING DAI, QI LI, JOAN REDWING, DARRELL SCHLOM, XIAOXING XI, The Pennsylvania State University, KAMEL SALAMA, The University of Houston — Epitaxial MgB₂ films have been successfully fabricated by *ex situ* annealing of B films, grown by chemical vapor deposition (CVD), in Mg vapour. The films show a sharp superconducting transition T_c of about 40 K, a low residual resistivity of less than $2 \mu\Omega\text{cm}$, and a high residual resistivity ratio RRR of about 10. At self field, the value of critical current density J_c for a $3 \mu\text{m}$ thick film is $1.7 \times 10^6 \text{ Acm}^{-2}$ at 5 K and $1.2 \times 10^6 \text{ Acm}^{-2}$ at 20 K. The high T_c , low residual resistivity, high RRR and high J_c indicate the cleanness and good connectivity of the films. The results demonstrate that the *ex situ* deposition method can produce clean MgB₂ films with superior superconducting properties, which is significant for applications such as MgB₂ superconducting cavities and coated conductor wires and tapes.

¹Dr. Wang will be presenting

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