Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Superconductivity in the Tungsten Bronzes PHILLIP WU, Department of Applied Physics, Stanford University, Stanford, California 94305, USA and Geballe Laboratory for Advanced Materials, Stanford Universit, SATOSHI ISHII, KENJI TANABE, Department of Applied Electronics, Tokyo University of Science, Katsushika-ku, Tokyo 125-8585, Japan, KO MUNAKATA, ROBERT H. HAMMOND, Department of Applied Physics, Stanford University, Stanford, California 94305, USA and Geballe Laboratory for Advanced Materials, Stanford Universit, KAZUYASU TOKIWA, Department of Applied Electronics, Tokyo University of Science, Katsushika-ku, Tokyo 125-8585, Japan, THEODORE H. GEBALLE, MALCOLM R. BEASLEY, Department of Applied Physics, Stanford University, Stanford, California 94305, USA and Geballe Laboratory for Advanced Materials, Stanford Universit — Via pulsed laser deposition and post-annealing, high quality K-doped WO_{3-y} films with reproducible transport properties are obtained. A home built two-coil mutual inductance setup is used to probe the behavior of the films in the superconducting and normal state. The inverse penetration depths and dissipation peaks are measured as a function of temperature and field. Separately, via thin film deposition techniques, we report for the first time stable crystalline hexagonal WO_3 on substrates. In order to tune the physical properties of the undoped material, we utilized an ionic liquid gating technique. We observe an insulator-to-metal transition, showing the ionic liquid gate to be a viable technique to alter the electrical transport properties of this material. By comparing the alkali and ionic liquid gated WO_3, we conclude with some remarks regarding how superconductivity arises in this system.

Phillip Wu
Dept of Applied Physics, Stanford University, and
Geballe Laboratory for Advanced Materials, Stanford University

Date submitted: 14 Nov 2014 Electronic form version 1.4