

Susceptibility of $(\text{Tl}_{1.85}\text{Re}_{0.15})\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10.3}$ thin film on sapphire substrate with CeO_2 buffer layer

W.M. Woch¹, A. Dujavová², R. Zalecki¹, A. Kołodziejczyk¹, M. Sojková², Š. Chromik²

¹ *Solid State Physics Department, Faculty of Physics and Applied Computer Science, AGH University of Science and Technology, Mickiewicza 30, 30-059, Kraków, Poland,*

² *Institute of Electrical Engineering, SAS, 841 01 Bratislava, Slovak Republic.*

The $(\text{Tl}_{1.85}\text{Re}_{0.15})\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10.3}$ thin film on sapphire substrate with CeO_2 buffer layer was prepared using the RF magnetron sputtering and an *ex situ* thallination in a one zone configuration. Since the rhenium of the superconducting sample consists of very small grains with average size about 0.5 μm . The thickness of the film is 300 nm.

In this paper we measured the real as well as imaginary part of *a.c.* susceptibility as a function of temperature for several values of *a.c.* applied magnetic field. From these measurements we obtained both the inter and intra-granular critical temperatures. Using the Bean critical state model we have calculated the critical currents as a function of temperature.