

# **Epitaxial** non-c axis superconducting Bi-2212 thin films targeting novel THz planar devices

K. Endo[1], S. Arisawa[2], and P. Badica[3]
[1]Kanazawa Institute of Technology, Japan; [2]National Institute for Materials Science, Japan;
[3]National Institute of Materials Physics, Romania

Molecular organic chemical vapor deposition was employed for the growth of 3D epitaxial (117) $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi-2212) thin films on (110) $SrTiO_3$ and (110) $LaAlO_3$ substrates. Substrates were vicinal with off angles up to 20°. X-ray diffraction $\varphi$ - $\psi$ scans demonstrate that films grown on a flat substrate are composed of twinned grains, while the films on vicinal substrate are *twin-free*. When growth of the film is performed at two temperatures (growth starts at 550-600 °C and continues at 700-750 °C) a higher quality is obtained.

The twin-free film grown by the two-temperature route has a zero-resistance critical temperature of 37 and 32 K when the measuring current is applied in-plane parallel and perpendicular to [001] direction of the substrate.

The concept of novel planar THz devices is presented and suitability of the twin-free non-*c* axis thin films for their fabrication is discussed.

**Biography**

Kazuhiro Endo is a Professor at Kanazawa Institute of Technology. He received his BEng, MEng and PhD from the University of Tokyo. He was a researcher and then Head of Advanced Thin Films Laboratory at the Electrotechnical Laboratory (now called the National Institute for Advanced Industrial Science and Technology). He published over 250 papers and presented more than 50 invited talks.

Shunichi Arisawa has completed his PhD at the age of 27 years from the University of Tokyo and started working for National Research Insutitee for Metals. Now he works for National Insititute for Materials Science.

Dr. Petre Badica is a Senior Researcher (Res. Prof.) at NIMP. He is a former JSPS-STA, NIMS, NEDO, MANA, Alexander von Humboldt fellow and Visiting Prof. of Nanyang Technological University, Singapore and Tohoku University, Japan. He has published more than 200 papers.

**Presenting author details**

Full name: Kazuhiro Endo
Email ID: kendo@neptune.kanazawa-it.ac.jp
Contact number: +81 76-274-7968
Session name/ number: Advancement of Materials/ 2
Category: Oral presentation