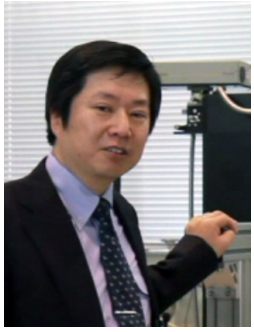
TcSUH Special Seminar

Texas Center for Superconductivity at the University of Houston

Dr. Takanobu Kiss
Kyushu University
Department of Electrical Engineering
Graduate School of Information Science and Systems
Professor, Research Institute of Superconductor Science and Systems
Vice-Director, concurrent Director of the Ito-Branch, LT Center



Monday, July 8, 2013
12:00 Noon – 1:00 P.M.
Houston Science Center, Room 102

Recent Advancement and Future Prospects of RE-123 Coated Conductor Development in Japan

ABSTRACT

Based on the significant progress of process technologies, $RE_1Ba_2Cu_3O_{7-\delta}$ (RE-123) coated conductors are now available commercially on an industrial scale with length of several 100's of meters. In this talk, I will address recent advancement of RE-123 coated conductor technologies in Japanese national project. In-field current carrying capability and long length spatial homogeneities have been improved effectively based on the insight of current limiting mechanism clarified by the advanced characterization techniques such as multi-functional microscopy and site-specified microstructural analysis. I will also present further potential of the in-field critical current that is expected to offer significantly enhanced practical performance by the nano-structural engineering of long wires.

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BIOGRAPHY

Professor Takanobu Kiss received his doctorate in 1991 from Kyushu University (KU), Japan. That April, he became a faculty member at KU as a research associate. In 1996, he became an associate professor at KU, and was promoted to a full professor in 2007. While at KU, he was a visiting scholar at the Applied Superconductivity Center, University of Wisconsin-Madison in 1999, and in 2000 a visiting scientist at Low Temperature Division, University of Twente, the Netherlands, both awarded by the MEXT Fellowship. He is the recipient of JSPS Young Scientist Fellowship (1989) and the 10th Superconductor Science and Technology Award of the Society of Non-Traditional Technology (2006). He was also awarded research funds including JSPS "KAKENHI", International Research Promotion by METI, "Strategic-innovation" by JST, "Advanced Low Carbon Technology Research and Development Program" by JST, "Strategic Japanese-EU Coordinated Research Program" by JST and "RE-123 coated conductor wire development" by NEDO-METI.

Professor Kiss is an expert in the area of critical current and vortex pinning of superconducting materials. His group has developed novel methods for spatially resolved measurements of electromagnetic properties of superconductors that include in-field low temperature laser scanning microscopy, scanning SQUID microscopy and advanced scanning Hall probe microscopy. These studies focus on the understanding and resolving key performance issues of superconducting forefront materials and superconducting power devices. Perspectives of these studies are to lead breakthroughs in the energy-efficiency solutions to electric power grid, alternative energy, transportation and advanced medical systems. He has published 200+ research papers and several book chapters. He has also received over 50 invited talks on many continents - in the US, Europe, and Asia.

He has been the chairman of Superconducting Wire Development Committee at the Japanese National Project "Materials & Power Applications of Coated Conductors" by NEDO-METI, and a member of the Advisory Board of the IOP journal of Superconductor Science and Technology, International Editorial Board of the European Superconductivity News Forum and ICEC Board. He has served on international conferences, including CCA2010 Chairman, ICEC24-ICMC2012 Conference Secretariat, ASC Technical Committee Member 2004-2014, and ISS Chief Program Committee Member 2011-2013.

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