

## BMEiCON2013 Keynotes

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#### Abstract

#### Noninvasive Magnetic Resonance Temperature Imaging

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Noninvasive thermometry is one of the most difficult techniques in the field of medical imaging. It is especially important for maintaining effectiveness and safety of various thermal therapies. Among several imaging modalities, magnetic resonance (MR) imaging has been the only practical tool for clinical use, since a method using signal phase difference caused by the thermal shift of water proton resonance frequency was proposed. In conjunction with the advanced technologies of thermal therapies such as high intensity focused ultrasound (HIFU), noninvasive MR temperature imaging has been steadily improved. Starting from the background and basic physical principles, this lecture will cover the recent progress, latest topics, and future prospect of MR temperature imaging.

## Brief CV

Professional Activities: April 1986-March 1988 Systems engineer, Satellite Communications Systems, Division, NEC Corporation, Yokohama, Japan.

Academic Appointments: April 1988-March 1999 Research associate, Faculty of Engineering, Osaka City University, Osaka, Japan

July 1995-September 1999 Visiting Researcher, Department of Radiology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

April 1999-March 2000 Assistant Professor, Research Institute of Science and Technology, Tokai University, Hiratsuka, Japan

April 2001-March 2009 Associate Professor, Department of Human and Information Sciences, The Faculty of Information Science and Technology, Tokai University, Hiratsuka, Japan

April 2001-March 2005 Deputy Director, Department of Image-based Medicine, Institute of Biomedical Research and Innovation, Kobe, Japan

April 2006-March 2008 Senior Research Scientist, Molecular Imaging Research Group, Institute of Biomedical Research and Innovation

April 2008-March 2010 Director, Medical Device Development Center (MEDDEC), Pro-Cluster Kobe, Institute of Biomedical Research and Innovation, Kobe, Japan

April 2009-March 2011 Professor, Department of Human and Information Sciences, The Faculty of Information Science and Technology, Tokai University, Hiratsuka, Japan

November 2010-Present Chief Researcher, Foundation for Kobe International Medical Alliance, Kobe, Japan

April 2012-Present Chair Professor, Course of Information Science and Engineering, Graduate School of Engineering, Tokai University, Hiratsuka, Japan

Awards and Honors: 1998 Research Paper Award (Special Prize), Japanese Journal of Magnetic Resonance in Medicine

2003 RSNA 2003, 89th Scientific, Assembly and Annual Meeting, Educational Exhibit Award, Cum Laude

2006 Research Promotion Award, Japanese Society of Hyperthermic Oncology

2008 Distinguished Paper Award, Japanese Society of Hyperthermic Oncology

2011 Distinguished Reviewer for Magnetic Resonance in Medicine, International Society for Magnetic Resonance in Medicine

2012 Poster Presentation Award, 11th International Congress of Hyperthermic Oncology

Research Field: Biomedical Engineering, Applied Electromagnetics

Research Themes: MR thermometry, Interventional MRI