

T_CSUH Bi-Weekly Seminar

Texas Center for Superconductivity at the University of Houston

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Friday, February 15, 2008

Room 102, University of Houston Science Center
12:00 noon - 1:00 p.m.

The Ultrasensitive SQUID-Based Sensing Applications for Biomedical Imaging and Diagnostics

Abstract

Superconducting QUantum Interference Device (SQUID) is the most sensitive and stable detector of magnetic flux available. The SQUID sensing provides the unmatched sensitivity and temporal resolution used for detection of the electromagnetic field perturbation associated with the neuronal currents in the brain, fetal cardiac activity, and the nuclear spin magnetization in ultra-low field NMR/MRI. In this presentation, I will summarize the current status of SQUID biomedical applications relevant to their present scientific and technological challenges, focusing on those applications that convey fundamental technological breakthroughs in corresponding biomedical fields. I will then describe our activities in the area of fetal cardiac monitoring, vulnerable plaque detection, cancer diagnostics and ultra-low field MR imaging. I will also present new research highlights from our recent clinical study in London aimed at developing a new ultrasensitive magnetic probe for detecting the spread of breast cancer.



Dr. Brazdeikis received his Ph.D. from the Royal Institute of Technology (Sweden) and is currently a Research Associate Professor of Physics at the University of Houston and an Adjunct Associate Professor at UT-Health Science Center-Houston. He is a principal investigator of the HTS Biomagnetic Imaging laboratory at the Texas Center for Superconductivity (T_CSUH). He is the author of more than 40 articles in leading scientific journals. His current research activities are focused almost entirely on developing new biomedical applications of advanced magnetic sensors based on SQUID technologies. He has over five years' experience as an independent technology consultant and application developer for Baylor College of Medicine, UT-Health Science Center-Houston, and Texas Heart Institute. He recently co-founded a medical device start-up company, Endomagnetics Inc., to solve a range of important surgical and cancer diagnostic problems through the application of novel advances in biomagnetics, nanotechnology and magnetic sensing technology based on superconductors.

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