

Seminar series: Selected research topics in Biomedical Engineering

Location: DBE Lecture Room 14.003.02

1. November 2018, 12:30-14:00, host Matthieu Sarraçanie:

Whole-Body MR Imaging with varying magnetic fields

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Abstract:

It has been known since the early days of NMR that T1, one of the major sources of contrast in MRI, is more informative on tissue status at low magnetic fields. Unfortunately, low magnetic fields provide limited signal strength and the need for high-resolution images pushed MRI towards very high magnetic fields. New research groups are now re-investigating the use of low-field MRI for tailored applications and much information is needed to guide this search, as T1 is field-dependant.

This presentations will introduce a new technique, Fast Field-Cycling MRI (FFC-MRI), that allow combining low and high field for the investigation of T1 contrast in a variety of pathologies. The information provided by this new technology will be presented, as well as the current state of research at the University of Aberdeen.

Curriculum: Following a PhD in biomedical engineering at the University of Surrey, UK, Dr Broche has been working at the University of Aberdeen, Scotland, on the development of Magnetic Resonance Imaging (MRI) hardware and especially for Fast Field-Cycling MRI (FFC-MRI). He teaches statistics and the physics of FFC-MRI on the MSc programmes in Medical Physics, Medical Imaging, and Medical Physics Computing. To date Dr Broche has published over 40 publications, conference papers and journal reviews and is the owner of 2 patents related to MRI. He is an active member of ISMRMB, ESMRMB and IOP, as well as the Open Source Imaging Initiative community.

His researches interests encompass both physics engineering and clinical trials, with projects on optimization of radiofrequency receive chains, hardware synchronization and integration, pulse sequence programming, detection of osteoarthritis using the quadrupolar signal, characterisation of tumors at low magnetic fields or detection of liver fibrosis.