

PROPOSITION DE STAGE DE M1 POUR ETUDIANTS PHYSICIENS

2019 - 2020

INTERNSHIP OFFER – LEVEL: M1 – DURATION: 2 MONTHS

For M2 level, please check the openings for PhD positions

Topic: Impact of concomitant field gradients on low-field MR image quality

Scientific content

Our group at LKB performs methodological developments and in vitro validation of MRI in low magnetic field B (1 to 6 mT). Application to lung imaging using laser-polarised gases provides the driving momentum to this work. Maxwell's equations impose stringent constraints on magnetic field maps, and all imaging schemes in low-field MRI are prone to perturbative effects due to the so-called concomitant field gradients. In conventional MRI, the additional non-uniform field components associated to the applied linear variation of B amplitude lead to well-known image artefacts, particularly noticeable in case of operation at low field strength.

The objective of the proposed internship work is to investigate the contribution of additional RF field components inherent to the use of a non-uniform RF field direction in the unconventional TRASE imaging scheme which is currently studied. Details on the context and motivation of this work may be found on the following web page: <http://www.lkb.upmc.fr/polarisedhelium/openings-mri/>.

Techniques/tools

The work will include quantitative low-field MR investigations, numerical simulations using state-of-the-art tools, and comparison with more standard MRI techniques. It will thus provide opportunities for substantial experience in NMR and MRI.

Field(s): Interdisciplinary physics, NMR and medical imaging.

Type of internship: Experimental, instrumental, possibly with data processing.

Host institution

Place: Laboratoire Kastler Brossel (site: ENS-Lhomond)

Postal address: 24 rue Lhomond, 75005 Paris

Director of the host laboratory: Antoine Heidmann

Supervision and contact

Supervisor(s): Geneviève Tastevin / Pierre-Jean Nacher

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