

Dynamic Nuclear Polarization development and applications

Thierry Dubroca

National High Magnetic Field Laboratory, Tallahassee, USA

ABSTRACT: Thierry Dubroca is a Scientist at the National High Magnetic Field Laboratory in Tallahassee, FL (USA), nicknamed the Maglab. During his presentation he will introduce the Maglab's various user programs from Magnetic Resonance to fundamental physics. The main topic covered during his lecture will be on Dynamic Nuclear Polarization, a method which dramatically enhances the signal to noise ratio for Nuclear Magnetic Resonance experiments. In short, inside a high field magnet a high power microwave beam polarizes free radicals, which in turn transfer their polarization to nearby nuclei under study. The transfer mechanisms are dependent on the thermodynamics and sample preparation (temperature, solvent...). After a short introduction of the topic, Thierry Dubroca will discuss the related scientific and technology efforts at the Maglab (and elsewhere) as well as applications using this technique for Chemistry, Physics, Biochemistry, Material Science...