

Seminar

Sensitivity Enhancement in Solid-State NMR: Cross-Polarization and Dynamic Nuclear Polarization

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Solid-State NMR spectroscopy is used in biological and material research to study structure and dynamics of the system of interest. One major challenge in this method is to improve its sensitivity so that a large number of systems that have nuclear spin with low gyromagnetic ratio (γ) can be studied using solid-state NMR. Two methods to improve the sensitivity of the technique will be suggested in the talk. In the first part a new cross-polarization method to improve the heteronuclear polarization transfer efficiency among low γ nuclear spins in the presence of large anisotropic interactions will be introduced to minimize the loss of polarization during the mixing periods of the experiments. Experimental results on different systems, such as protein samples and fluoropolymers, will be shown. In the second part of the talk, I will discuss the application of microwave (μw) pulses to induce dynamic nuclear polarization (DNP) to improve the sensitivity of the solid-state NMR experiments by orders of magnitude. A new pulsed DNP method and a μw pulse sequence to reduce paramagnetic relaxation effects in DNP experiments will be presented.

Wednesday, Apr 11th 2018

11:30 AM (Tea/Coffee at 11:00 AM)

Seminar Hall, TIFR-H