



**TIFR Centre for Interdisciplinary Sciences,
Narsingi, Hyderabad 500075**

Seminar

**Slow Dynamics and Narrow Lines in Solution NMR by means
of Long Lived States and Coherences**

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In solution-state NMR spectroscopy, dynamic processes can be probed provided the nuclear relaxation rate constant does not exceed the rate constant of the process. Phenomena occurring on a time scale longer than the spin-lattice relaxation time constant, T_1 , were not amenable to study by conventional NMR before the discovery of long lived singlet states. However, using Long-lived nuclear spin states (LLS) and coherences (LLCs), one can probe dynamic processes that were beyond the scope using methods based on T_1 s and T_2 s. LLS experiments can be performed either in zero or in high magnetic fields for scalar coupled spin pairs. We developed methods for exciting and preserving LLS in high field for a wide class of molecules. Slow diffusion has been measured for a mixture of molecules having different NMR parameters using LLS. LLS have been observed in highly mobile parts (Gly-75 and 76) of Ubiquitin. Dynamic Nuclear Polarization (DNP) is one of the methods to overcome the inherent low sensitivity of NMR spectroscopy. We have conceived an experiment to preserve DNP enhanced magnetization by conversion into LLS. A way of improving resolution and sensitivity of NMR has been designed by creation of long-lived coherences (LLC) in biomolecules.

Wednesday, November 13th 2013

4:00PM (Tea/Coffee at 3:30PM)

Seminar Hall, TCIS