

Seminar

A Broadband Atomic Magnetometer Based NMR Spectrometer

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Atomic magnetometers are being used to detect NMR spectra within the frequency range of a few hundred Hz, especially for detecting J-spectra. In order to perform zero-to-ultralow-field (ZULF) NMR on samples with stronger J-couplings or in systems like solids, where the dipolar and quadrupolar couplings are more prominent, a magnetometer with a wider bandwidth is necessary. This seminar will present the design and development of an atomic magnetometer with a sensitivity of around $1\text{pT}/\sqrt{\text{Hz}}$ and a bandwidth of 24 KHz. The presentation will also discuss the building of an NMR spectrometer incorporating this atomic magnetometer along with a nuclear spin control system and the detection of NMR signals in magnetic fields ranging from a few nTs to tens of μT s using this instrument. Furthermore, the presentation will explore the theoretical aspects of zero-field NMR and our implementation of certain pulse sequences, such as spin echoes, at low magnetic fields.

Friday, Apr 26th 2024

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Auditorium, TIFR-H