Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Students' Annual Webinar

Atomic Magnetometry: Applications in Low Field NMR and Battery Diagnostics

George Kurian K K

Atomic magnetometers have been used for detecting NMR signals in zero magnetic field. In the absence of an external magnetic field, the Zeeman interaction and chemical shift are zero, and only the internal interactions dominate. So, zero-field NMR gives spectra in which the positions of peaks depend mainly on internal interactions. My talk will cover our progress in measuring NMR signals in the ZULF (zero to ultra-low field) regime. It will describe our efforts to measure the J spectra in zero fields. We achieved a sensitivity of less than 10 pT by using our atomic magnetometer with a bandwidth of 22 kHz and a dynamic range that allows us to use the magnetometer even in the earth's magnetic field. Our goal is to measure NMR signals in zero field from a powdered solid sample, which necessitates an atomic magnetometer with a bandwidth in kHz. I will also mention our progress in measuring magnetic fields from batteries for in-situ diagnosis using an atomic magnetometer.

Friday, Feb 17th 2023

11:00 AM

Seminar Hall, TIFR-H