

Homogeneously precessing domain in $^3\text{He-B}$: a tool for studying graphene

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Homogeneously precessing domain (HPD) can be observed in NMR experiments in superfluid $^3\text{He-B}$. HPD is characterized by coherent precession of magnetization with large tilting angle stabilized by superfluid spin currents. This state is a good tool for studying properties of $^3\text{He-B}$. We have developed a ^3He NMR setup using a dry cryostat and performed some preliminary measurements. At present, we are preparing an experiment for probing superfluid coherence across graphene membrane immersed in ^3He by means of the HPD. I will tell about this work and about preliminary measurements in a one-volume cell where we have found some new interesting features of the HPD.

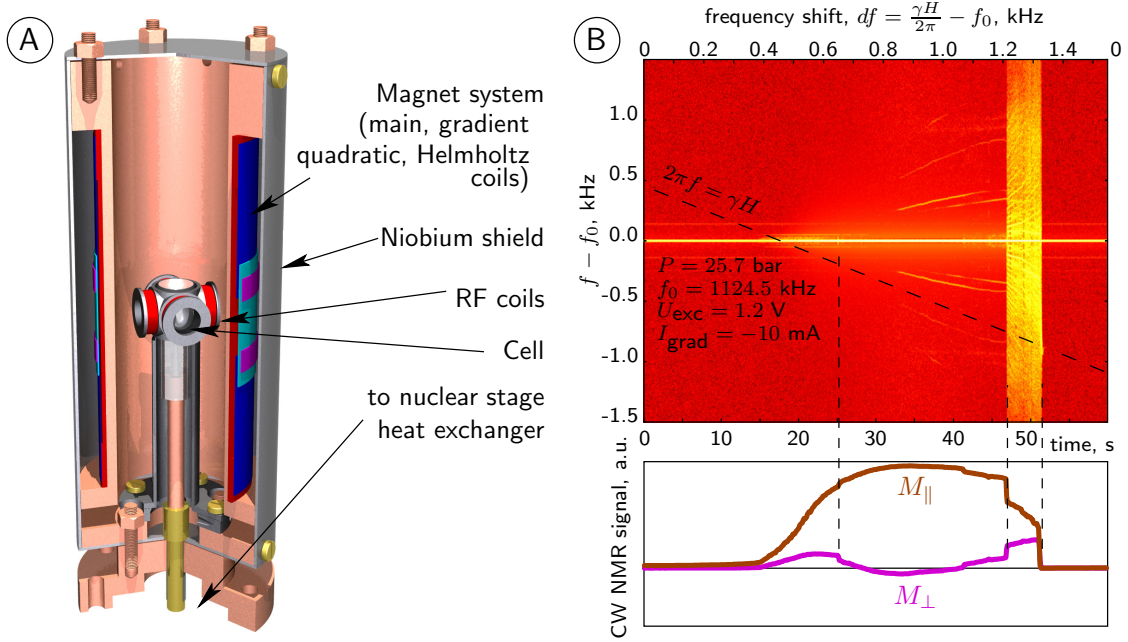


Figure 1: **A.** Magnet system and cell for preliminary experiments with HPD. **B.** Example of the measurement. HPD is created by continuous-wave NMR when constant magnetic field is slowly swept down. Signal from RF coils is recorded by oscilloscope and processed by sliding FFT. One can see side bands near the NMR frequency which are low-frequency oscillations of the HPD. We observe a few modes of such oscillations with frequencies proportional to square root of the shift between NMR frequency and Larmor frequency in the magnetic field. Also some unstable region can be seen at large frequency shifts.

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