

High-Field NMR with Solid-state Quantum Sensors

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Solid-state quantum sensors based on nitrogen vacancy centres have successfully achieved NMR detection of chemicals located in the diamond surface. Transitioning to high magnetic field scenarios would facilitate the detection of quantities encoding structural information such as chemical shifts and J-couplings.

In this presentation, I will delve into the challenges and opportunities related to high-field NMR at the microscale and examine recently proposed techniques, namely AERIS [1] and J-INSECT [2], designed to achieve high-resolution NMR detection of distinct energy shifts at elevated magnetic fields.

References

- [1] C. Munuera-Javaloy, A. Tobalina, and J. Casanova. *High-Resolution NMR Spectroscopy at Large Fields with Nitrogen Vacancy Centers*, *Phys. Rev. Lett.* 130, 133603 (2023).
- [2] P. Alsina-Bolívar, A. Biteri-Uribarren, C. Munuera-Javaloy, and J. Casanova. *J-coupling NMR Spectroscopy with Nitrogen Vacancy Centers at High Fields*. arXiv: 2311.11880.

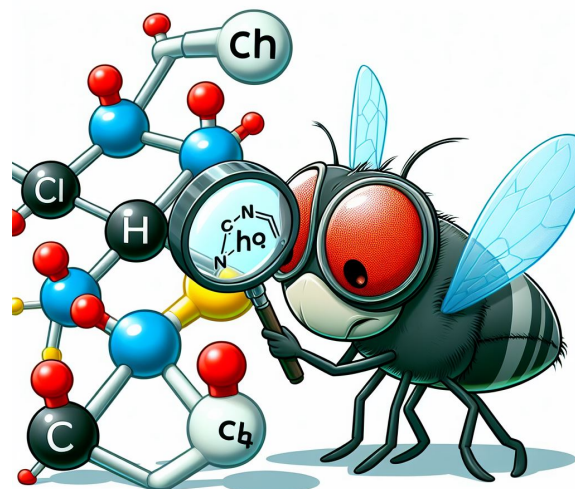


Figure 1: J-INSECT “agent” investigating a molecular compound.
