

Abstract Submitted
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Ultra-low field SQUID magnetic resonance for biomedical research P. BHUPATHI, Division of Physics, Mathematics and Astronomy, Cal Inst of Tech (Caltech), I. HAHN, Jet Propulsion Laboratory, Cal Inst of Tech (Caltech) — We are developing a SQUID (Superconducting QUantum Interference Device)-magnetometer system operating at 4K, for electron paramagnetic resonance (EPR) detection from room temperature samples in magnetic fields of the order of a Gauss. The magnetometer consists of a home-built, a second order gradiometer pick-up coil inductively coupled to the input of a commercially available two-stage dc SQUID amplifier with high bandwidth suitable for EPR, as well as NMR detection at wide range of frequencies up to a few MHz. Preliminary tests were done on samples of Pt powder at 4K and NMR signals have been detected in fields of few tens of gauss, with a minimum system sensitivity for spin concentration of $\sim 10^{17}$. We are currently developing an optimal SQUID gradiometer and a low temperature dewar for the EPR measurements. We plan to operate at low EPR excitation frequencies of a few MHz with the advantages of negligible sample heating and high penetration depth in biological systems. We discuss the prospects for *in vivo* biomedical EPR imaging.

P. Bhupathi
Cal Inst of Tech (Caltech)

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