

P5687: A Nanosecond-Resolved Ultrahigh-Density Spin-Polarized Hydrogen Magnetometer

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- We produce high-density spin-polarized H (SPH) atoms from HCl photodissociation (at ~1 bar), using a 100 ps UV laser pulse.
- These densities are 8 orders of magnitude higher than conventional methods.
- The electron polarization beats at the hyperfine frequency (1.42 GHz), and the magnetization quantum beats are detected using a pickup coil (Figs. at right).
- One application of pulsed-production of SPH is ns-resolved magnetometry
- We demonstrate ns-resolved B-field measurements
- We discuss potential applications in spin physics/chemistry, and potential further improvements

