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Drone Integration of an Atomic Optically Pumped Magnetometer for Airborne Magnetic Field Sensing

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We present early results on the integration of a compact, hot-vapor based optically pumped magnetometer (OPM) onto a drone platform for unshielded airborne magnetic sensing. This work is part of a broader effort to develop quantum magnetometry solutions for field applications for geo-prospection and the detection of unexploded ordnance. The system employs an alkali vapour-based OPM operating at a data rate of 1 kSa/s, offering high temporal resolution suitable for drone-based surveys.
Particular attention has been paid to keeping the sensor lightweight, integrating it with the drone's onboard and navigation systems, and ensuring electromagnetic compatibility between the sensor and drone electronics.
A test campaign is underway to explore the system's ability to capture magnetic field data during flight, providing a platform for evaluating performance and guiding the next development phase toward an airborne gradiometer.
This poster outlines the system design, integration challenges, and initial flight data, setting the stage for the next phases of in-field deployment.

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