



PROTOTYPE DIAMOND MAGNETOMETER FOR NAVIGATION

University of Sydney – UTS –
Advanced Navigation – DSTG

"A prototype of packaged quantum sensor for navigation using nitrogen-vacancy-diamond-based magnetometry."

Problem

There is a need to develop a world-leading quantum position, navigation and timing system enabling troops or vehicles to navigate in GPS-denied territories.

Solution

The team developed a platform technology that achieves low size, weight, power and high sensitivity at the same time. The room temperature magnetometer is on a single chip, affords a high dynamic range and is designed as a fully integrated solution with semiconductors. Its capabilities can be used for navigation in hostile environments, communication, medical imaging, and inertial measurements.

The chip itself, designed in partnership with an NSW-based semiconductor company, takes what typically occupies a large part of a laboratory bench and integrates it on a chip that is less than one square millimetre.

This solution is now one of only two existing on-chip quantum magnetometers worldwide and is the only fully integrated solution.

In partnership with Advanced Navigation and Perceptia Devices, the research team is working on integrating this technology into a navigation-ready device for use in land, sea, and air applications.

START TRL: 2

EXIT TRL: 4

DIN INVESTMENT: \$750,000

EXTERNAL INVESTMENT: \$4,800,000

NO OF RESEARCHERS: 7

NO OF NEW ROLES: 2

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DIN SII Funding
DIN \$750,000

2020

US Air Force
Funding \$750,000

2022

ASCA EDT White Paper
Funding \$3,300,000

2024

Main Sequence
Funding \$750,000

2025