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"AION (Atom Interferometer Observatory and Network) and MAGIS (Matter-wave Atomic Gradiometer Interferometric Sensor) are experiments utilising strontium atoms to search for ultra-light dark matter and mid-band gravitational waves. Both experiments have embarked on building a series of atom interferometers ranging from 10 m to 1 km baselines, with MAGIS currently constructing the 100 m detector at Fermilab and AION planning to build the 10 m detector at The University of Oxford. Technical features and parameters are shared between AION and MAGIS intending to establish a quantum sensors network.

The University of Liverpool is responsible for developing the phase-shear detection platform for AION and MAGIS, employing a piezo-driven retro reflection mirror inside the ultra-high vacuum chamber. The ultimate target is high-precision control of 50 nrad which will be achieved by an optical feedback system to track the angle of the retro-reflection mirror via an optical lever.

Rutherford Appleton Laboratory hosts one of five strontium labs in the AION consortium currently working on the 2D and 3D strontium magneto-optical traps and a 1064 nm dipole trap. The ultimate goal is to achieve strontium interferometry with the potential to test the out-of-vacuum phase-shear imaging platform in collaboration with the University of Liverpool."

Poster Abstract

Session Classification: Poster Session

Track Classification: Experimental - Work towards long baseline AIs