



Contribution ID: 9

Type: **Poster**

## **ELERTAS, Gedminas (University of Liverpool)**

*Monday 13 March 2023 17:30 (1 minute)*

MAGIS-100 is a strontium atom interferometer with a baseline of 100 m under construction at Fermilab that aims to explore fundamental physics. AION is a UK initiative to develop this technology further. AION project has established five strontium atom interferometry laboratories nationwide, and a 10 m prototype is planned. Both projects will search for the ultralight dark matter fields and lead the technology for a future kilometre-scale detector that would be sensitive to gravitational waves from known sources. To achieve this, MAGIS 100 and AION will have to demonstrate the shot-noise limited detection, the ability to launch atoms for tens of meters, maintain the record-breaking spatial separation of the wave packets, and account for multiple systematic uncertainties.

As part of UK input to MAGIS-100 and a future AION-10 experiment, the University of Liverpool is contributing to the development of a phase-shear detection platform. The phase-shear detection method is a novel technique which imprints the interference fringes across the atom cloud allowing single-shot measurements of the phase and contrast, increasing the repetition rate of the experiment and better control of the systematics, such as Coriolis force. The phase-shear platform design, specifications, and integration into the experiment's detection system are presented.

### **Poster Abstract**

**Session Classification:** Poster Session

**Track Classification:** Experimental - Work towards long baseline AIs