



Contribution ID: 8

Type: **Poster**

### **Gedminas Elertas**

*Thursday 4 April 2024 16:50 (2 hours)*

MAGIS and AION are long baseline strontium atom interferometry experiments. 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 should 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. The University of Liverpool is developing a phase-shear detection platform for both projects. The phase-shear detection is a 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 consists of an XHV chamber that houses an ultra-high precision 4-inch mirror reflecting the main interferometry beam. The phase-shear fringes are in-printed by precisely controlling the angle of this mirror via in-vacuum piezoelectric actuators. Electronic and optical feedback loops achieve the precise movement of the mirror. The design, specifications, integration into the experiment's detection system, and status are presented.

**Session Classification:** Poster Session & Wine & Coffee