



Contribution ID: 77

Type: **Poster presentation**

An optically pumped Cesium magnetometry array for the n2EDM experiment

Tuesday 9 September 2025 17:08 (1 minute)

The n2EDM experiment at the Paul Scherrer Institute aims to measure the neutron electric dipole moment with a sensitivity of below $1\text{E}-27$ e-cm by observing neutron spin precession in a near perfectly uniform magnetic field. Precise control of systematic effects, particularly those caused by magnetic field non-uniformities, is crucial for achieving this sensitivity. To address this, an array of 112 optically pumped Cesium vapor magnetometers, capable of picotesla-level precision measurements, will be deployed. This system will provide real-time measurements of magnetic field gradients, enabling the control and reduction of systematic uncertainties arising from magnetic field non-uniformities. In this contribution, the design, performance, and integration of this system into the experimental setup will be presented.

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Session Classification: Poster Session and BBQ