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An optically pumped magnetometer array used for a fundamental physics experiment

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The n2EDM experiment at the Paul Scherrer Institute is a fundamental particle physics experiment which aims to measure the neutron electric dipole moment with a sensitivity below 1×10^{-27} e·cm. Achieving this level of sensitivity requires exact control of magnetic field uniformity to reduce systematic effects. To this end, an array of 112 optically pumped cesium vapor magnetometers using a free alignment precession measurement principle will be deployed.

This array 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.

Authors: VAN KEIRSBILCK, Judith (KU Leuven); SEGNER, Lea (ETH Zürich); SANCHEZ-REAL ZIELNIEWICZ, Luz (ETH Zurich)

Co-authors: SEGARRA, Efrain Patrick (PSI - Paul Scherrer Institut); BISON, Georg (PSI - Paul Scherrer Institut); KIRCH, Klaus Stefan (PSI - Paul Scherrer Institut); KLETZL, Victoria (PSI); BONDAR, Vira (ETH Zürich)

Presenter: SEGNER, Lea (ETH Zürich)

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