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(G*) Optical magnetometry for the TUCAN nEDM experiment

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The TUCAN collaboration aims to provide an ultra-precise measurement of the neutron electric dipole moment, resulting in a planned sensitivity of 10-27 e*cm. EDM experiments of this kind require measuring changes in the precession frequency of ultracold neutrons as they are subjected to parallel and anti-parallel electric and magnetic fields. In order to reach the planned sensitivity, precise control of these magnetic fields and their gradients is required. To this end, the group is developing an array of optical (Cs based) magnetometers and analysis software sensitive enough to accurately characterize magnetic-field dependent systematic uncertainties to better than 10-28 e*cm.

Operation of the first fibre optic coupled prototypes is demonstrated in this presentation, as well as the work done in optimizing the deployment of the system in order to identify magnetic field dependent systematic effects to the required precision.

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