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Characterisation of the simultaneous spin analyser developed for the n2EDM experiment at the Paul Scherrer Institute

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on behalf of the nEDM collaboration

In the n2EDM experiment, the measurement of the neutrons spin state is required. Neutrons are first fully polarised in a super conducting magnet and then subjected to a magnetic field of $1 \mu\text{T}$ and a strong electric field (around 15 kV/cm). The goal is to measure the neutrons precession frequency and to assess the possible frequency shift induced by the interaction between the electric field and the neutron EDM. For such a purpose, the Ramsey's oscillating fields method is used: it requires the counting of the spin up and the spin down UCN. To do so, a U-shaped Simultaneous Spin Analyser (USSA) was built at the Laboratoire de Physique Corpusculaire (LPC Caen). It is composed of two arms which separately analyse one of the two spin components. Each arm contains a Spin Flipper (SF), an analysing foil and a neutron counter (GADGET). The first tests of the USSA were carried out in July 2022 at the ultracold neutron source of the Paul Scherrer Institute (PSI Switzerland). A preliminary characterization of the USSA is presented in this poster.

Primary author: Mr LEJUEZ, Anthony (LPC Caen, France)

Co-authors: GOUPILLERE, Damien (LPC Caen, France); BAN, Gil (LPC Caen, France); NAVILIAT-CUNCIC, Oscar (LPC-Caen); SAENZ, William (LPC); LEFORT, thomas (University of Caen)

Presenter: Mr LEJUEZ, Anthony (LPC Caen, France)

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