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Data analysis of the search for an electric dipole moment of the neutron

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An electric dipole moment of the neutron (nEDM) is intrinsically violating the combined symmetry of charge and parity (CP). One necessary condition to create a matter/antimatter asymmetric universe from symmetric starting conditions is a sufficiently strong source of charge/parity violation (CPV) in the fundamental physics describing the early Universe. A discovery of a nEDM value larger than the SM prediction ($\leq 1\text{E-}31$ ecm) would be an indication for a yet unknown source of CPV and might help to explain the matter/antimatter asymmetry of the Universe, or shed light on to the strong CP problem.

At the Paul Scherrer Institute (PSI) in Switzerland, a collaboration of 16 institutions is searching for the nEDM using ultracold neutrons (UCN). In 2015 and 2016, we took more than 55000 single measurements each with an average of approximately 11500 UCN. The dataset with a pre-analysis sensitivity of 0.95×10^{-26} ecm is sufficient to improve the current upper limit, $d_n < 3 \times 10^{-26}$ ecm @90% C.L. [J.M. Pendlebury et al. PRD 92, 092003 (2015)]. This poster will present the summary of the ongoing analysis by combining results from two analysis groups, both working on independently blinded data.

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