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Search for a Neutron Electric Dipole Moment at the Paul Scherrer Institut

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At the new ultracold neutron source at the Paul Scherrer Institut (PSI) a collaboration of 15 European institutions is setting up an experiment to search for the nEDM with improved sensitivity. The same apparatus which provided the present best limit on the nEDM ($d < 2.9 \times 10^{-26}$ ecm 90% CL, Baker et al., Phys. Rev. Lett. 97 (2006) 131801), was moved from the Institut Laue Langevin (ILL) in spring 2009 to PSI. Since then it was thoroughly investigated and several components have been upgraded and improved. Most remarkable are: the HV system, the magnetic field control and demagnetization method, the mercury co-magnetometer, and an additional 12 channel array of scalar cesium magnetometers.

In December 2010 we could store first UCN in our apparatus at PSI. This spring the co-magnetometer was running continuously during several weeks for a measurement of the mercury geometric phase, one of the most important systematic effects.

In general all subsystems are working. We have ongoing studies improving the understanding of systematic effects. First data taking runs are scheduled for autumn 2011. Expected statistics might be sufficient to improve on the previous result. Two hundred nights of data taking in 2012 and 2013 should increase the sensitivity to $d_n < 5 \times 10^{-27}$ ecm in the case of a null result.

Simultaneously the collaboration is developing an entire new apparatus to further gain an order of magnitude in sensitivity

$O(10^{-28})$ from 2015 onwards.

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