# PSI's ultracold neutron source and the search for an electric dipole moment of the neutron.

Bernhard Lauss[1]

[1] *Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland*

*On behalf of the PSI UCN Team and the nEDM collaboration*

*Bernhard.Lauss@psi.ch*

The Paul Scherrer Institute's second spallation target serves for neutron production at the ultracold neutron (UCN) source [1]. After thermalization in heavy water the neutrons are further cooled in ~30 liters of solid deuterium at 5 K and finally down-scattered to become ultracold. UCN are then transported via an intermediate storage vessel and ~8m long UCN guides towards 3 experimental areas. Regular operation of the UCN source started in 2011 and scientific proposals are now being invited. We will report on the characterization measurements and the experience gained in operating the UCN source.


The experiment to search for a permanent electric dipole moment of the neutron (nEDM) was installed in area South and is being operated by an international collaboration. The present apparatus uses the substantially improved setup which before led to the best nEDM limit so far [3]. Data-taking started in 2013. In parallel a new double-chamber apparatus is being developed aiming at another order of magnitude increase in sensitivity. We will report on the performance of our experiment, its present status and give an outlook.

References

[1] B. Lauss, Physics Procedia 51 (2014) 98–101.
[2] C.A. Baker et al., Physics Procedia 17 (2011) 159-167.
[3] C.A. Baker et al., Physical Review Letters 97 (2006) 131801.