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Development of a monitoring system for the Ultra-Cold Neutron (UCN) source at PSI

Saturday 23 January 2010 12:10 (20 minutes)

At the Paul Scherrer Institute (PSI) in Villigen, Switzerland, the construction of a high intensity ultra-cold neutron source is nearing completion. It uses a 1.3 MW proton beam for the production of neutrons in a spallation target. After moderation the UCN enter a ˜2 m3 storage volume inside a biological shield. From there they can be transported to the experiments via UCN guides.
A detection system is being developed to monitor the UCN density inside the storage volume. The system will have to withstand a very high neutron and gamma radiation level of up to 13 MGy/y. The detector will have to operate in a clean vacuum and at a temperature of ˜60 K. Furthermore, the detection system has to be small in order not to decrease the UCN storage properties of the storage volume substantially. The detector is based on a 1-2 mm2 6Li-glass scintillator which is read out by a Geiger-Mode APD at the end of a 5 m long quartz light guide.
An overview of the ongoing development work will be presented.

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Session Classification: Student talks