REPORT ON A FIRST NEUTRON TEST OF A NEW 2D POSITION-SENSITIVE DETECTOR OF THERMAL NEUTRONS

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The small angle neutron scattering time-of-flight spectrometer "YuMO" at the high flux reactor of IBR-2 (Dubna) has been operating successfully since 1984.
Recently, the Franck Laboratory for Neutron Physics (FLNP), in collaboration with the company 2D at Grenoble and the University of Goettingen have developed a new 2D position sensitive detector (PSD) with a central hole. The data acquisition is based on the delay line technique. This PSD will be installed at the YuMO spectrometer (Fig.1).

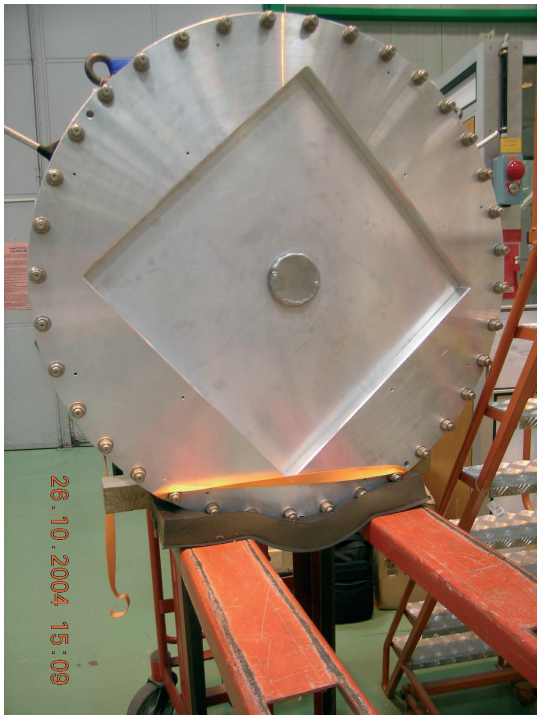

Figure 1. Main view of detector

The first neutron test of this detector has been performed at the beam-line G5-6 of the LLB. The detector was filled at a test pressure equal to 1 bar for CF_4 and 0.1 bar for ^3He. For the estimation of the parameters of the detector we used several Cd-plates with different slit-sizes: 15, 12 and 10 mm as shown in Fig.2.

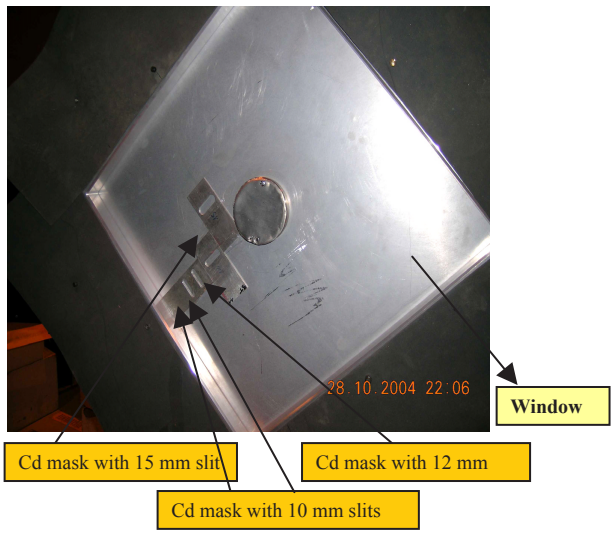

Figure 2. View of Cd slits during neutron test in LLB

The results of the tests of the detector are depicted in Fig.3. The final results yield the following information about the main parameters of the detector: standard deviation of the efficiency: 12% and positional resolution of the order of 3 mm.

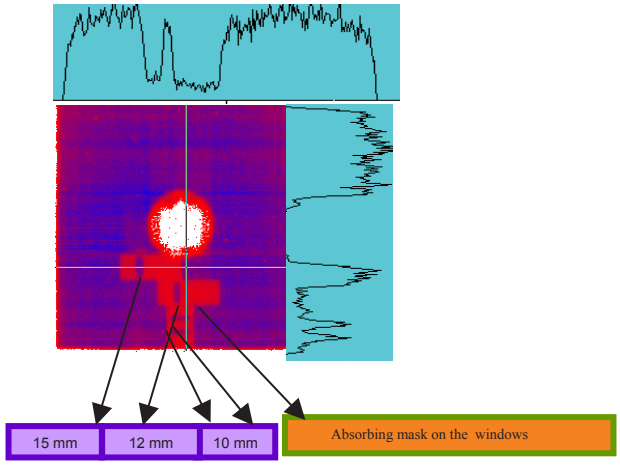

Figure 3. Main test result

Acknowledgments

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