Contribution ID: **72** Type: **not specified**

Thermal neutron measurements with high efficiency and high granularity, using large area Micromegas detectors

Micromegas are Micro-Pattern Gaseous Detectors (MPGD), which have been used in many particle and nuclear physics experiments since their invention in 1996. MPGDs provide high gain, fast signals, high rate capabilities, better aging properties, lower cost and simplified manufacturing processes compared to other gaseous detectors. Appropriately designed Micromegas detectors can be used for neutron measurements. Using special fabrication techniques (Microbulk and XY-Microbulk technology), very low mass-budget, neutron transparent detectors can be built, if required.
Due to the 3He shortage crisis, there is a lot of ongoing research on thermal neutron detection techniques based on alternative converters. Thin films of 10B or 10B4C are used convert neutrons into ionizing particles which are subsequently detected in gas proportional counters, but only for small or medium sensitive areas so far. We propose here a large high-efficiency (up to 50% with 0.025 eV neutrons) Micromegas-based neutron detector with several 10B4C thin layers mounted inside the gas volume in different configurations (substrate material, geometry, and sensor). The principle has been tested with a small size prototype (overall 15x15 cm2). The design is scalable to large area detectors.

Authors: TSILEDAKIS, Georgios (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR)); PAPAEVANGELOU, Thomas (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR))

Presenter: PAPAEVANGELOU, Thomas (CEA/IRFU,Centre d'etude de Saclay Gif-sur-Yvette (FR))