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## MIMAC : DETECTION OF LOW ENERGY RECOILS FOR DARK MATTER SEARCH

A. Trichet<sup>1</sup>, F. Mayet<sup>1</sup>, O. Guillaudin<sup>1</sup> and D. Santos<sup>1</sup>

**Abstract.** The MIMAC project is based on a matrix of Micro Time Projection Chambers ( $\mu$ -TPC) for Dark Matter search, filled with He3 or CF4 and using ionization and tracks. The first measurement of the energy resolution of this  $\mu$ -TPC is presented as well as its low threshold.

Cosmological observations (Komatsu *et al.* 2008, Tristram *et al.* 2005) seem to point out that most of the matter in the Universe consists of cold non-baryonic dark matter. Nowadays, researchs are focused on Weakly Interactive Massive Particles (WIMPs) and especially on the lightest supersymmetric particle which is the neutralino in most models. Mass and elastic cross-section with ordinary matter can be computed in the framework of minimal SUSY models and lead to a small event rate  $\mathcal{O}(10^{-5} - 1) \text{ day}^{-1}\text{kg}^{-1}$ . Thanks to underground laboratory and shielding, many experiments can reach this sensibility and try to observe a nuclear recoil through ionization, heat or light production due to WIMP elastic scattering.

The MIMAC project is based on a matrix of Micro Time Projection Chambers ( $\mu$ -TPC), filled with <sup>3</sup>He or CF<sub>4</sub> and using ionization and particle tracks to discriminate nuclear recoils and electrons and to look for an univocal directional signal due to WIMP interactions. <sup>3</sup>He or CF<sub>4</sub> have significant advantages for Dark Matter search. They are both dominated by axial interaction which is complementary with scalar interaction (Moulin *et al.* 2005). Most of the WIMP events produce recoils energies below 10 keV. Moreover, the neutron capture is dominant process below 10 keV in <sup>3</sup>He, with a released energy of 764 keV, leading to a clear signature of a neutron interaction.

We will discuss of the first measurement of the low energy resolution of this  $\mu$ -TPC, developed at CEA Saclay. More details on the measurement of the quenching factor of <sup>4</sup>He and the experimental set-up may be found in (Mayet *et al.* 2008, Santos *et al.* 2008). A good precision have been reached for all the measurements

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