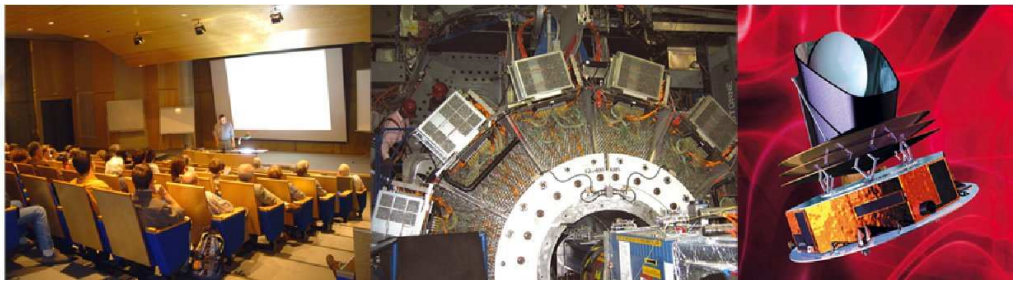
LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE



*Séminaire du Laboratoire de l'Accélérateur Linéaire*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## Mardi 16 Décembre 2008 à 11 :00

# DM-TPC : a novel apparatus for directional Dark Matter detection


Directional detection is key to provide unambiguous observation of dark matter even in the presence of insidious backgrounds.

The DM-TPC collaboration is developing a TPC with optical readout with the goal of detecting the sense and direction of the elastic recoils generated by Dark Matter interactions. The detector, filled with $CF_4$ gas at low pressure, is equipped with a mesh-based amplification region that allows for 2D imaging of the recoils in a CCD camera. The third coordinate of the recoil is provided by PMTs. The sense of the direction is determined by measuring the energy loss along the recoil track.

The performance of this detector has been studied using alpha particles, low-energy neutrons, and x-rays. Results from a first prototype clearly demonstrated the suitability of this approach to measure directionality by observing the "head-tail" effect for low- energy nuclear recoils.

Two 10-liter prototypes of the DMTPC detector have recently been built, and are ready to be moved to an underground laboratory for a one-year run in 2009. A larger ($1m^3$) detector is also being designed. A one-year underground run with such detector will allow us to improve the current sensitivity on spin-dependent interaction on protons by about a factor 50.


## Salle 101 du LAL - Bât. 200, Orsay

Thé et café seront servis 1/4 h avant le séminaire


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