

# Techniques and Results for the Direct Detection of Dark Matter

*Monday, 15 February 2010 14:00 (50 minutes)*

A review of the current status of experiments on direct Dark Matter detection will be given. A talk will be focused on special technique developed for searching rare events of WIMP –atomic nucleus elastic scattering. In general, the technique of selection of such events is based on simultaneous measurements of at least two species of energy deposition: for example, phonon and ionisation signals in cryogenic bolometers, scintillation and ionisation signals in noble gas two-phase detectors. Other important aspects in these experiments are requirements of superior radio purity of elements of Dark Matter detectors and methods of suppression of radioactive background in experimental setups, especially of neutron background. These has grown nowadays to a new instrumentation direction, a so called low low-background technique.

Among all types of Dark Matter detectors, cryogenic and noble gas detectors have reached the best sensitivities to WIMPs, and the obtained limits have nearly scratched a region of predictions of SUSY theory on a two-dimensional parameter plot of cross section versus WIMP mass. To investigate this region a new generation of ton-scale detectors is required. In these detectors a residual background of WIMP –atomic nucleus elastic scattering events will be reduced by several orders of magnitude and must reach a superior low level of  $\sim 1$  event/kg/year.

## **Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):**

Not required: invited talk

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