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SNOLAB



Deep, Dark Detection The DEAP-3600 Dark Matter Experiment

Department of Physics Colloquium

A wide variety of astronomical observations appear to indicate the existence of Dark Matter particles making up about 25% of the Universe. However, to date there has been no conclusive direct observation of these particles. The DEAP-3600 Dark Matter Detector will use 3600 kg of liquid argon for a sensitive search for Weakly Interacting Massive Particles (WIMPS) 2 km underground in the SNOLAB international laboratory near Sudbury, Canada. Pulse shape discrimination in the light output will be used to avoid radioactive background from ^{39}Ar beta decay in the liquid argon. Great care in the control of local radioactivity and the reduction in cosmic ray background due to the great depth will enable the use of an almost background-free fiducial volume of 1000 kg. This will provide a sensitivity of about $10\text{-}46\text{ cm}^2$ for 100 GeV WIMPS after 3 years of operation, beginning early in 2015. This is substantially better than current limits for the spin-dependent interaction. Details of the detector and its construction status will be presented.



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