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Title: Direct Detection of Dark Matter with MiniCLEAN

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Abstract

VI International Workshop on the Dark Side of the Universe

Direct Detection of Dark Matter with MiniCLEAN

RAUL HENNINGS-YEOMANS — Overwhelming astrophysical evidence indicates that non-baryonic Dark Matter constitutes most of the mass of the Universe. Nevertheless, the particle nature of Dark Matter remains a long standing mystery. The use of noble liquids as scintillators in single and dual-phase detectors are some of the most promising scalable WIMP detectors currently planned and under construction. The MiniCLEAN experiment will have 92 PMTs looking at a liquid Argon detector mass of over 500 kg in a single-phase configuration. It will use Pulse Shape Discrimination (PSD) techniques to search for low-energy WIMP nuclear recoils inside a fiducial volume. Liquid Argon would be interchangeable with liquid Neon to study A^2 dependence of a potential signal and examine backgrounds external to the cryogenic liquid. For the Argon run, MiniCLEAN projects a sensitivity in terms of spin-independent WIMP-nucleon cross-section of $2\times10^{-45}\mathrm{cm}^2$ for a mass of 100 GeV/c^2. A status report of MiniCLEAN will be presented as well as plans to deploy the experiment at SNOLAB.

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APPENDIX FOR DSU2010 — Overwhelming astrophysical evidence indicates that non-baryonic Dark Matter constitutes most of the mass of the Universe. Nevertheless, the particle nature of Dark Matter remains a long standing mystery. The MiniCLEAN experiment will have 92 PMTs looking at a liquid Argon detector mass of over 500 kg in a single-phase configuration. It will use Pulse Shape Discrimination (PSD) techniques to search for low-energy WIMP nuclear recoils inside a fiducial volume. MiniCLEAN projects a sensitivity in terms of spin-independent WIMP-nucleon cross-section of $2\times10^{-45}\mathrm{cm}^2$ for a mass of 100 GeV/c^2. A status report of MiniCLEAN will be presented as well as plans to deploy the experiment at SNOLAB.

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