

## Backgrounds in the DEAP-3600 Dark Matter Experiment

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The DEAP-3600 experiment is searching for dark matter with a single phase liquid argon (LAr) target, located at SNOLAB. For a background-free exposure of 3000 kg·yr, the projected sensitivity to the spin-independent WIMP-nucleon cross section at 100 GeV/c<sup>2</sup> WIMP mass is  $10^{-46}$  cm<sup>2</sup>.

The experimental signature of dark matter interactions is keV-scale argon recoils producing 128 nm LAr scintillation photons which are wavelength shifted and observed by 255 PMTs. To reach the large background-free exposure, a combination of careful material selection, passive shielding, active vetoes, fiducialization and pulse shape discrimination (PSD) is used. The main concept of the background rejection in DEAP is the powerful PSD, employing the large difference between fast and slow components of LAr scintillation light. Discrimination of electronic and nuclear recoils on the order of  $10^{10}$  can be achieved, which is sufficient to successfully reject <sup>39</sup>Ar beta-decays with a specific activity of 1 Bq/kg in argon with natural isotopic composition.

The designed background level of DEAP-3600 is less than 0.6 events in a 3000 kg·yr exposure. The experiment was filled in November 2016 and is currently taking dark matter search data. This talk will report on the measured background levels in DEAP based on first data.

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