Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **326** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

DEAP-3600 Hardware Upgrades and Third Fill

Monday 9 June 2025 15:30 (15 minutes)

DEAP-3600 is a single-phase liquid argon detector designed to probe for high mass WIMP dark matter candidates. A global collaboration, DEAP has previously run from 2016 to 2020 in the Cube Hall at SNOLAB. From extensive background modeling a small background rate was expected in the WIMP region of interest. These events were predicted to originate in two ways: Either shadowing caused by the neck geometry or direct energy degradation caused by dust particulates in the liquid argon. The former was addressed by implementing new neck flow guides that are coated with Pyrene doped polystyrene, a material with a significant difference in time constant to that of argon, to allow the events be easily tagged. The latter was addressed with a new particulate removal system. New process lines were added so that liquid can be removed from the detector, filtered, and reintroduced to the detector in a clean safe way. There are also redundant mitigations for both backgrounds included and are available if needed. The installation of these upgrades was finished in February 2025, and the procedure to begin the third fill of DEAP-3600 is currently underway, with completion expected in August 2025.

Keyword-1

DEAP-3600

Keyword-2

Dark Matter

Keyword-3

Author: MURRAY, Austin

Presenter: MURRAY, Austin

Session Classification: (PPD) M2-9 Searches for dark matter I | Recherche de la matière noire I (PPD)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)