



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3288 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Measuring alpha quenching factors in liquid argon using Argon-1

Monday 6 June 2022 16:30 (15 minutes)

The DEAP-3600 experiment located at SNOLAB is a single phase liquid argon detector looking to confirm the existence of dark matter via direct detection. The energy signature of the dark matter may be examined with 255 photomultiplier tubes (PMTs) measuring the scintillation signal produced via nuclear recoils of argon nuclei by a dark matter particle. As a result, modelling background channels that produce nuclear recoils in the detector is critical in ensuring a well understood dark matter search region. In particular, understanding the scintillation signature of alpha particles in liquid argon will aid immensely in the development of a proper background model.

Alpha particles produce a reduced scintillation signal compared to electrons of the same energy, an effect known as “quenching”, which is in general energy dependent. In this talk, we will discuss progress on measurement of alpha particle quenching using Argon-1, a modular single phase liquid argon cryostat located at Carleton University, in Ottawa, Ontario.

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Session Classification: M3-8 Dark Matter Experiment II (PPD) | Experiences de matière sombre II (PPD)

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