Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **138** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) POS-J98 – A search for neutrino absorption with 40Ar using the DEAP-3600 detector

Wednesday 9 June 2021 14:21 (2 minutes)

The highest energy range of the solar neutrino spectrum is dominated by ^{8}B neutrinos produced in the pp-chain in the Sun and by hep neutrinos. R.S. Raghavan, K. Bhattacharya, and others have predicted that neutrino absorption with ^{40}Ar is a possible interaction for neutrinos with energies above 3.9 MeV. In this case, neutrino induced nuclear transitions from ^{40}Ar to ^{40}K are feasible. One possible transition produces a delayed coincidence signature with a mean lifetime of 480 ns. A search for this process relies on understanding the backgrounds for this search, specifically neutron capture gammas. These neutrons include both radiogenic neutrons from PMTs and detector materials and cosmogenic neutrons from muon interactions with the surrounding rock. We propose to search for this process using 3 years of data from the DEAP-3600 dark matter experiment and present the latest efforts in this on-going study. DEAP-3600 is a liquid argon (LAr) direct dark matter experiment based at SNOLAB that is designed to detect WIMP-nucleon scattering in argon. The experiment's ultra-low background, high sensitivity and its large target mass could make it possible to observe this process for the first time.

Author: ELLINGWOOD, Emma (Queen's University)

Presenter: ELLINGWOOD, Emma (Queen's University)

Session Classification: W-POS-J #80-107 Poster session (PPD) / Session d'affiches (PPD)

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