Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **17** Type: **Invited Speaker / Conférencier(ère) invité(e)**

The NEWS-G light Dark Matter search experiment: New results from the LSM

Monday, 8 June 2020 15:15 (15 minutes)

The NEWS-G direct dark matter search experiment employs spherical proportional counters (SPCs) with light noble gases as target media to search for low-mass Dark Matter (DM). The next generation of the experiment is a 140 cm diameter SPC with a new sensor design and improved shielding, and will profit from a single-electron energy threshold to be sensitive to particle DM with a mass as low as 100 MeV/c2. Before its upcoming installation at SNOLAB, the detector was commissioned at the Laboratoire Souterrain de Modane in France, with a temporary water shield. During this time a short physics campaign with pure methane gas was undertaken, proffering a hydrogen-rich target and reduced backgrounds compared to the neon mixture planned for future measurements. Preliminary results of this campaign are shown, including UV laser and Ar-37 calibration data. The electron-drift properties of this detector allows for the identification of single primary electrons within an event, prompting a new analysis methodology to characterize the single-electrons response of the SPC. The unique two-hemisphere configuration of the sensor also allows for fiducialization.

Primary author: DURNFORD, Daniel (University of Alberta)

Co-author: PIRO, Marie-Cécile (University of Alberta)

Presenter: DURNFORD, Daniel (University of Alberta)

Session Classification: PPD-2 : Dark Matter | Matière sombre

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