Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **433** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) POS-J83 – Exploring dark matter detection using Solar capture and the Non-Relativistic Effective Operator formalism.

Wednesday 9 June 2021 13:51 (2 minutes)

In the search for particle dark matter (DM), the most prominent model is the Weakly Interacting Massive Particle (WIMP). Should particle DM have some weak interaction with baryonic matter, the DM would interact with the matter found in the Sun and other massive bodies. When the DM scatters to velocities below the local escape velocity, this results in gravitational capture and subsequent annihilation into neutrinos, which can be seen at telescopes such as IceCube. This is complementary to direct detection experiments, as solar capture is sensitive to different types of interaction, mass ranges, and different parts of the DM velocity distribution. We use Non-Relativistic Effective Operators (NREO) to produce combined constraints from solar and direct detection searches for WIMPs. NREOs allow for the description of general interactions that can favour properties such as the spin-orbit coupling of nucleons in a nucleus. We combine the general solar DM constraints from IceCube with a variety of direct detection experiments such as Lux, Xenon1T, PandaX, Pico 60, Cresst II, CDMSlite, and Darkside 50 using GAMBIT, the Global And Modular BSM Inference Tool and perform a statistically consistent global analysis of the current state of DM detection using the NREO formalism.

Author: AVIS KOZAR, Neal

Co-author: VINCENT, Aaron (Queen's University)

Presenter: AVIS KOZAR, Neal

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

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