Contribution ID: **147** Type: **Poster (Student, In Competition) / Affiche (Étudiant(e), inscrit à la compétition)**

Search for Dark Matter with Superheated Liquids: Calibration and Geant4 Monte Carlo Simulations in PICO

Wednesday 18 June 2014 19:02 (2 minutes)

One of the most important unsolved mysteries in physics is the possible existence of dark matter, which could account for 85% of the total mass in the universe. PICO experiment intends to detect a specific type of dark matter particle, the weakly interacting massive particles (WIMPs), via scattering on 19F nuclei from C4F10 liquid in superheated droplet detectors and from C3F8 liquid in bubble chamber detectors. I will present the physics of superheated liquid detectors, as well as calibrations with alpha particles, neutrons and gamma rays. I will discuss in particular the test beam calibrations with mono-energetic neutrons at the UdeM 6 MegaVolts Tandem accelerator. These measurements could be extended to sub-keV recoil energies and are in excellent agreement with Geant4 Monte Carlo simulations.

References

[1]- S. Archambeault & al., Constraints on Low-Mass WIMP Interactions on 19F from PICASSO, Volume 711, Issue 2, 3 May 2012, Pages 153–161; http://www.sciencedirect.com/science/article/pii/S0370269312003760

Author: Mr LAFRENIÈRE POISSON, Matthieu (Laboratoire René J.A. Lévesque, Université de Montréal, Montréal, Québec, Canada)

Presenter: Mr LAFRENIÈRE POISSON, Matthieu (Laboratoire René J.A. Lévesque, Université de Montréal, Montréal, Québec, Canada)

Session Classification: PPD Poster Session, with beer (7) / Session d'affiches PPD, avec bière (7)

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