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Characterization of superheated fluids in PICO-0.1 bubble chamber for the search of Dark Matter (student talk)

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Search for direct detection of dark matter has become more and more precise, and it is essential to understand perfectly how our detectors behave when interacting with ordinary matter, in order to potentially see interactions with dark matter. In the case of the PICO experiment, the behaviour of the superheated fluids used as active mass in the detectors is a key component of the search.

This talk will present my work on two freons used in the PICO-0.1 calibration bubble chamber, and how we were able to detect proton recoils in this type of detector : first, I studied freon-r115 (C₂ClF₅) and the monoenergetic reaction $^{35}\text{Cl} (n, p) ^{35}\text{S}$, producing a 17 keV ^{35}S recoil and a 600 keV proton recoil, directly inside the detector; second, I studied freon-r134a (C₂H₂F₄) and the recoils of protons from collisions with fast neutrons.

Primary author: Mr TARDIF, Frédéric (University of Montreal)

Presenter: Mr TARDIF, Frédéric (University of Montreal)

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