Contribution ID: **51** Type: **Oral**

AT3PC: Active Tritium Target TPC. Conceptual design of a novel Time Projection Chamber detector for reactions using tritium

Wednesday, 10 October 2018 11:30 (20 minutes)

Pairing correlations play a crucial role in determining the properties and structure of atomic nuclei. The evolution of these correlations in exotic nuclei has received much attention in recent years, as new accelerator facilities are providing unique radioactive beams for study. Of particular interest is the role of neutron-neutron pairing in neutron-rich isotopes, where the effects of weak binding and continuum coupling are important. Clearly, the best tool to study these correlations is the (t,p) transfer reaction, particularly suited to probe the 2n pair density. Due to the compelling capabilities that time projection chambers (TPC) offer, it seems natural to explore the use of a tritium gas target TPC, with an equivalent thickness around 100 times larger than typical solid targets, enabling experiments with exotic beams with a very low intensity (of the order of 100 pps). In this work, we propose to develop a dedicated TPC featuring two separated and isolated gas regions: an inner cell deployed along the beam direction, that will contain the gas target of interest, such as tritium (3H2) or 3He or other rare and expensive gases, and an outer volume for tracking purposes. The AT3PC is intended to operate inside a solenoid magnet to enable the reconstruction of the energy of the particle through the magnetic rigidity.

In this work, we will present the preliminary conceptual design and comprehensive simulations.

Primary author: Dr AYYAD, Yassid (MSU-FRIB)

Co-author: Dr MACCHIAVELLI, Augusto (LBNL)

Presenter: Dr AYYAD, Yassid (MSU-FRIB)

Session Classification: Session 4 - Isotopically enriched and radioactive targets

Track Classification: 3 - Isotopically enriched and radioactive targets