

## **R2D2: a xenon TPC for neutrinoless double beta decay search**

*Friday 19 July 2024 11:45 (15 minutes)*

The search for neutrinoless double beta decay could cast light on one critical piece missing in our knowledge i.e. the nature of the neutrino mass. The observation of such a potentially rare process demands a detector with an excellent energy resolution, an extremely low radioactivity and a large mass of emitter isotope. Nowadays many techniques are pursued but none of them meets all the requirements at the same time. The goal of R2D2 is to prove that a cylindrical high pressure TPC filled with xenon gas could meet all the requirements and provide an ideal detector for the  $0\nu\beta\beta$  decay search. The prototype has demonstrated an excellent resolution with argon and xenon up to the maximal possible operation pressure of 10 bar. The resolution is constant in the pressure range studied and almost independent on the gas used in the TPC. In the proposed talk the R2D2 results obtained with the current prototype will be discussed as well as the project roadmap and future developments.

### **Alternate track**

#### **I read the instructions above**

Yes

**Primary author:** MEREGAGLIA, Anselmo (Centre National de la Recherche Scientifique (FR))

**Presenter:** MEREGAGLIA, Anselmo (Centre National de la Recherche Scientifique (FR))

**Session Classification:** Neutrino Physics

**Track Classification:** 02. Neutrino Physics