



Contribution ID: 19

Type: Oral presentation

## **PolarEx, a new facility for on-line nuclear orientation at Alto : Multipolarity mixing ratio data analysis**

*Friday, November 29, 2019 9:40 AM (20 minutes)*

Low Temperature Nuclear Orientation (LTNO) experiments allow to probe magnetic properties of polarized exotic nuclei. With this technique, we observe nuclei under extreme conditions, that is to say very low temperatures (~10mK) and very high magnetic field (10-100T). Under such conditions, the radioactive emission is anisotropic, and its shape tells us more about the nucleus structure.

Nuclear orientation give access to different observables. The nuclear magnetic moment can be directly measured, using NMR technique. The multipole mixing ratio, proportionnal to the ratio of two multipolarity matrix element, can also be studied and gives acces to structure informations. As a special feature of LTNO, far-reaching studies of fundamental weak interactions and associated symmetries can be made as well as investigations of parity non conservation.

The PolarEx apparatus, located at Alto in Orsay, France, is designed to perform this kind of study. It is a  $^3\text{He}$ - $^4\text{He}$  dilution refrigerator, coupled to a magnet and a detection system. The detection system allowed up to 8 detectors, either gamma or particle detector, in the plan perpendicular to the orientaion axis to study the spatial asymmetry of the gamma radiation.

For the moment it is operating off line on long lived nuclei, but it will be ready for on line experiment very soon. The coupling of PolarEx with Alto will open a large range of studies of neutron rich nuclei, thanks to its great versatility.

In this contribution will be presented the status of PolarEx and the on going off-line studies, in particular the new measurements of the multipole mixing ratios in  $^{56}\text{Fe}$ . With our analysis, we have reproduced existing mixing ratios, have improved the precision of some of them, and have also measured unknown mixing ratios.

### **Field**

Nuclear physics/PolarEx

### **Language**

English

**Authors:** THOER, Rémy (csnsm); VERNEY, David (IPN Orsay); IBRAHIM, Fadi (IPN Orsay); GAULARD, CAROLE (Université Paris Sud); LE BLANC, François (Institut de Physique Nucléaire); ROCCIA, Stephanie (CSNSM)

**Presenter:** THOER, Rémy (csnsm)

**Session Classification:** Oral presentations session

**Track Classification:** Physics