Contribution ID: **45** Type: **Oral Communication**

Light element micro-analysis at AIFIRA facility

Wednesday, 9 July 2014 12:00 (20 minutes)

The AIFIRA facility (Applications Interdisciplinaires des Faisceaux d'Ions en Région Aquitaine) in operation at CENBG (Centre d'Etudes Nucléaires de Bordeaux-Gradignan) may be a reliable tool adapted to a wide range of scientific fields. Indeed, ion beam analysis and imaging techniques, material characterization and irradiation (fast neutrons and charged particles), all are carried out at AIFIRA to conduct an interdisciplinary research program. The main activity of the platform is driven by the microbeam dedicated to the analysis, imaging, and characterization of biomedical samples and advanced materials. Its last version was recently presented to the community [1] [2]. Since, the microbeam continuously underwent developments and improvement especially of the target chamber. This constant evolution is due to the great flexibility offers by the beam line, which potentially allows a wide range of applications (chemical analysis at the sub-cellular scale, micro-tomography, nuclear reaction analysis, proton beam writing, etc.).
A recent development is about Elastic Recoil Detection Analysis (ERDA), which is known as one of the ultimate technique for the quantification of the elusive Hydrogen. Furthermore, the long working distance quadrupoles configuration can focus deuterons, as well as protons and alpha particles in the MeV energy range. Taking all of those specificities into consideration, it is possible to perform quantitative analysis of light elements at sub-micrometre scale through the use of ERDA, NRA and PIGE techniques.

The communication will focus on the analysis of light elements through a description of the available set-ups on the target chamber. We will also illustrate the performances of the microbeam with selected examples, for instance the analysis of 3D bioactive scaffolds with ERDA and NRA

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Session Classification: Session 5 - Nuclear Microprobe Applications: Material Science