Seminar general

Ion beam analysis (IBA) techniques: synergetic approaches and new tools to quantify light elements

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Ion beam analysis (IBA) is a set of powerful analytical techniques that have enabled a wide variety of measurements important not only in the development of the advanced materials underlying all modern technology, but also in many other fields from Archaeology to Biology.

Elastic Backscattering Spectrometry (EBS) and Particle Induced X-ray Emission (PIXE) are well established IBA techniques which benefit from commercially available analysis software. The EBS-PIXE simultaneous and self-consistent analysis is a special case of synergetic approach that takes advantage of both techniques' strong points.

In the last years, the IAEA (International Atomic Energy Agency) has encouraged the development of PIGE (Particle Induced Gamma-ray Emission) as a standard technique in the quantification of elements lighter than sulphur. PIGE, an IBA technique based on gamma-producing nuclear reactions, is particularly effective for light elements detection. The Lisbon group recently developed a computer code, named ERYA-Profiling that allows a full standard free PIGE analysis of in-depth heterogeneous samples.

The talk will be structured in four main topics:

(1) IBA overview.
(2) EBS-PIXE simultaneous and self-consistent analysis in cultural heritage pieces, and biological samples.
(3) ERYA-Profiling code and the efforts made by the Lisbon and IFIN-HH groups to solve the discrepancies in the literature's cross-sections data and the new measurements that will occur at the IFIN-HH.
(4) Deep sea mining and IBA techniques.

Thursday, 30 June 2022, 14:00
The Training and Research Centre of IFIN-HH
(the new building located between DFN and ELI-NP)