XAHRM-Lab

X-ray Advanced HiREDS *(High Resolution Energy Dispersive Spectrometry)* Research and Metrology Laboratory

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The participation of C2TN at the AHEAD2020 project.

AHEAD2020

The XAHRM-Lab is part of the AHAED2020 project work programme contributing to the objectives of its activity on Technology Innovation and Exploitation for Society (JRA7) and comprises full upgrade of the current LCEA HRHE-PIXE facility installed in 2008, which holds the first-generation C2TN XMS-PIXE system, to a novel Metallic Magnetic Calorimeter (MMC) detector for use in benchmark measurements on selected scientific topics.

This will be carried out essentially in two stages.

In the first stage, to be fully concluded well before February 2022 (including tests, confidential reports and manuals), the current facility will be upgraded into an advanced multi-geometry system configurable to: (i) an in vacuum (1keV to 120 keV) HiREDS-PIXE coupled to other IBA techniques (Total-IBA) system; (ii) an in vacuum HiREDS XRF system; (iii) a PIXE-XRF system and (iv) an in air HiREDS-PIXE system.

Once the implementation of the MMC detector at C2TN is completed, the XAHRM-Lab will engage in activities of the second stage aiming to test, validate and demonstrate the new facility capacities in the context of: (a) PIXE dedicated software development, fundamental research and geomaterials studies (continuation of present research work); (b) Cultural Heritage (CH) applications; (c) HiREDS X-ray Fluorescence research; and (d) airborne particle (AP) studies. Subjects (b) and (d) will also include tests made in conjunction with the INFN laboratory LABEC (Florence), where a TES based XMS system will be also installed and evaluated during AHEAD2020.