

## CHARACTERIZATION OF CULTURAL HERITAGE USING A MICRO-BEAM

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The use of micro-beams and ion beam analytical techniques to study cultural heritage materials is becoming usual among the scientists. When the proper experimental conditions (for example energy, current or acquisition times) are used, these beams do not induce any radiation damage and, when the measurements are done in open air, the need of sampling can be avoided. The possibility to obtain compositional distributions with high accuracy and without, or minimal, sample surface preparation make them very suitable for the characterization of a wide range of materials.

In the nuclear microprobe available in Lisbon the analyses can be performed in vacuum or in open-air conditions using alpha or proton beams with energies up to  $\sim 2.3$  MeV [1]. Examples of results obtained in different type of materials such as paper, tiles, paintings or metals will be given (see Fig. 1) and the safe experimental conditions will be discussed.



*FIG. 1. Different type of materials (paper with iron-gall ink and metallic object) during the measurements in open-air conditions.*

### REFERENCES

- [1] [http://www.ctn.tecnico.ulisboa.pt/projs/microfex/uk\\_mfex\\_idx.html](http://www.ctn.tecnico.ulisboa.pt/projs/microfex/uk_mfex_idx.html)