

Synchrotron μ -XRF imaging and μ -XANES spectroscopy at the new PUMA beamline at SOLEIL

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Archaeometry is a scientific discipline which aims at characterizing, studying, preserving and/or dating archeological materials by applying scientific analytical techniques. Such analyses allow to retrieve historical and artistic information about the past and can be performed with standard instrumentation, devoted to a specific technique, or with dedicated instrumentation built to better satisfy the requirement of archeological/artistic artefacts.

This is the case of PUMA, standing for French for "Photons Utilisés pour les Matériaux Anciens", a hard X-ray imaging beamline at SOLEIL synchrotron optimized for the scientific communities of the heritage sciences. It is equipped with a 2D imaging end-station which offers a resolution of several microns with elemental (XRF), chemical (XANES) and structural (XANES and XRD) contrast.

In this work, we present the first analyses performed at the newly opened-to-users PUMA beamline on three set of samples, namely decorated ceramics [1], painted architectural terracottas [2] and natural stones treated with conservation products [3].

The first and recent results obtained on the analyzed samples are here presented to highlight the potential offered by this new beamline in characterizing different kind of archaeological materials, highlighting possible research outcomes and new challenges in cultural heritage studies.

References

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