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Ion beam analysis of silver foils in gilt-leather wall coverings

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Gilt leathers, ancestors of our wallpapers, are luxurious decorations used all over Europe between the 16th and the 18th century. Despite their name, gold is not present in the composition of these artifacts. Indeed, these decors were made by applying a silver foil to the leather then covered with a yellow varnish, which presents a gold-like appearance.

Nowadays it is still difficult to date and to classify gilt leathers as they are not signed and assumptions concerning their provenance are generally made from stylistic studies [1]. Recently an analytical methodology was developed to characterize the different components within gilt leather to learn about the manufacturing technique and degradation processes [2].

The present research focuses on the characterization of the silver foil by non-invasive ion beam analyses. This combines analyses by PIXE (Particle Induced X-ray Emission) to characterize the silver foil composition and RBS (Rutherford Backscattering Spectrometry) to localize the different components. The results obtained from the analysis of a corpus of over 40 historical samples originating from different geographic areas in Europe will be presented. In addition, model samples were prepared according to an ancient recipe [3] and were also analyzed to investigate the influence of the different materials on the results obtained on historical samples. RBS also gives information on the characteristics of the foil such as its thickness (*Figure 1*) which, combined to the composition and the stylistic data, should help us find provenance markers for the different workshops in Europe.

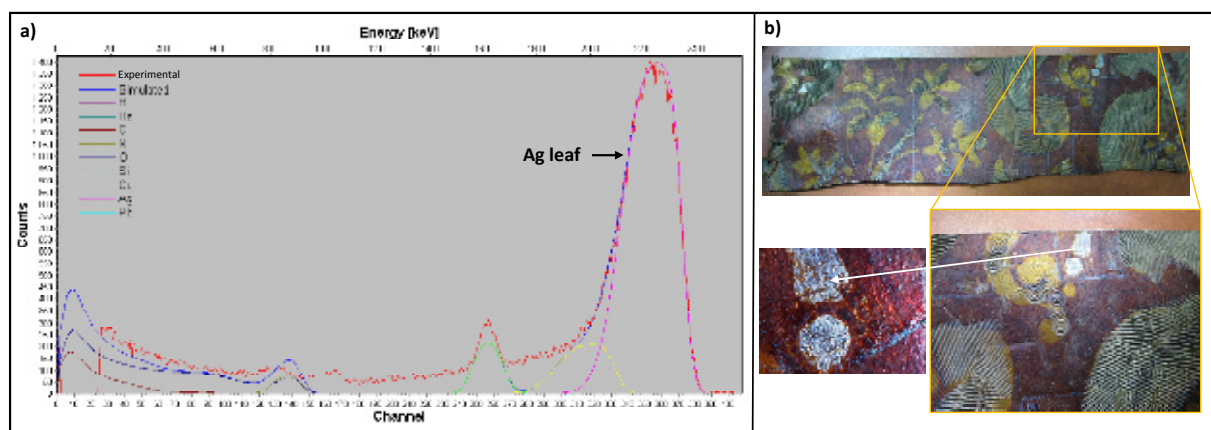


Figure 1: Gilt leather from the Palazzo Chigi, Ariccia in Italy (1671, maker: Agostino Nespola); (a) RBS spectrum allowing the calculation of the Ag foil thickness as being $0.123 \pm 0.028 \mu\text{m}$; (b) visible images of the artifact.

[1] J.-P. Fournet, Mémoire de recherche approfondie, PhD dissertation, Ecole du Louvre, Paris, 2004.

[2] C. Bonnot-Diconne, L. Robinet, C. Pacheco, M. Ioele, M. Paris, ICOM-CC 17th Triennial Conference Preprints, 2014, art. 0701, 8 pp.

[3] A.D. Fougeroux de Bondaroy, Description des arts et métiers, 1762, 42 pp.