

# Investigating ancient Islamic gold coins through non-invasive techniques: elemental analysis and smartphone colorimetry

*Thursday, 7 March 2024 11:30 (15 minutes)*

In this presentation, the non-invasive analytical investigation of ancient Islamic gold coins is presented. A two-fold methodology was deployed: first, portable X-ray fluorescence was used in order to analyse the elemental profile. Second, a smartphone-based procedure was developed and validated to obtain the CIELAB descriptors of the samples.

Based on the elemental profile, a stable content of gold was found around 90 % (w/w), followed by lower levels of silver. Also, some remarks about the origin of the coins are presented based on the elemental composition. Addressing the elemental description, the smartphone-based method was designed in order to tackle the main challenges associated to these cultural heritage artifacts, like glare. Upon comparison with a reference device, the proposed smartphone method allowed to obtain an objective description of the CIELAB descriptors of the ancient coins.

Overall, this presentation presents an approach to investigate valued historical samples from a non-destructive perspective. The combination of robust techniques like X-ray fluorescence coupled to new advances based on smartphones allows one to characterise these samples from a wider and more complete perspective. These results prove the potential that new technologies present in the field of analytical applications to the Cultural Heritage field.

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