



Contribution ID: 35

Type: **Poster**

Calibration of p-XRF on ancient pottery using NAA results

Wednesday, December 9, 2020 5:40 PM (20 minutes)

The chemical fingerprint of a representative corpus of sherds from Central Europe, North Africa, Western and Central Asia was identified by using neutron activation analysis (NAA) at the FRM II. A first batch of 30 homogenized pottery samples from archaeological field projects of LMU researchers were analysed using standard procedures following both short and long-time irradiation and measured on gamma-detectors after different decay times. 40 elements incl. many trace elements could be determined. The NAA results were then compared with the results of portable XRF instruments which are routinely used on archaeological excavations in Germany and abroad. Properly calibrated with securely identified reference material such portable equipment allows for the serial screening of ancient pottery, which in turn informs us on raw material acquisition, production cycles and, ultimately, the role of imports and the supply networks of a given society. The set of analyses carried out therefore constitutes an important step in the improvement of a research methodology. The FRM II samples will constitute the basis of a specialized calibration for ancient pottery analysis that shall subsequently be established as reference standard for other laboratories and researchers working with p-XRF.

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Session Classification: Joint poster session of MLZ User Meeting and DN2020

Track Classification: UM: Materials Science