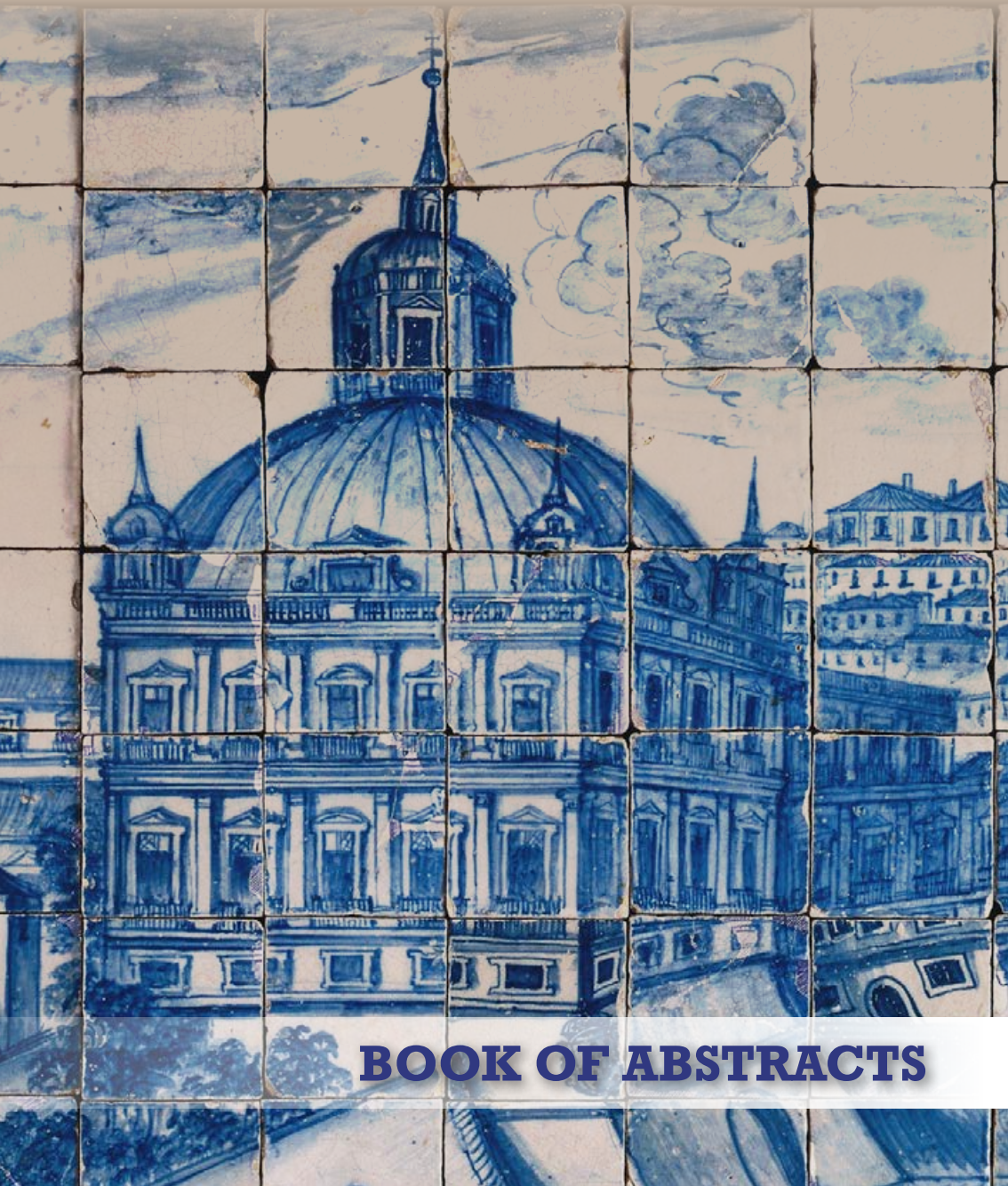




International conference
on analytical techniques
in art and cultural heritage
LISBON | 07-12 MAY



BOOK OF ABSTRACTS

TECHNICAL INFORMATION

TECHNART2023 BOOK OF ABSTRACTS

TITLE

TECHNART2023

Non-destructive and Microanalytical Techniques in Art and Cultural Heritage. Book of Abstracts

EDITORS

Marta Manso, Vanessa Antunes, Maria Luísa Carvalho

PUBLISHER

Universidade Nova de Lisboa - Faculdade de Ciências e Tecnologia,
Lisboa, 7th › 12th May 2023, LISBON, Portugal

ISBN

978-989-9164-08-6

ACKNOWLEDGEMENTS

Luiza Oliveira (NOVA school of Science and Technology)
Gonçalo Baptista, José Grilo, Rúben Inocêncio and Sara Pandolfi
(NOVA School of Science and Technology)
Dora Fernandes and Filipe Bernardes (MNÁz)
Sawitri Bulska

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Analytical investigation into silk from traditional Japanese samurai armours

Ludovico Geminiani^{(1)*}, Cristina Corti⁽²⁾, Barbara Giussani⁽¹⁾, Giulia Gorla⁽¹⁾, Moira Luraschi⁽³⁾, Laura Rampazzi⁽²⁾

(1) Dipartimento di Scienza e Alta Tecnologia, Università degli Studi dell'Insubria, Via Valleggio 11, 22100 Como, Italy;

(2) Dipartimento di Scienze Umane e dell'Innovazione per il Territorio, Università degli Studi dell'Insubria, Via Sant'Abbondio 12, 22100 Como, Italy;

(3) Museo delle Culture, Villa Malpensata, Riva Antonio Caccia 5, Lugano, Switzerland;

*Correspondence: lgeminiani@uninsubria.it; Tel.: +39 0312386475.

In order to correctly manage collections of historical silks, it is a good practice to gain an insight into conditions and nature of the yarns. This paper presents the results of a wide work of characterisation of silk fabrics coming from a collection of traditional Japanese samurai armours which date back from 15th to 20th century (Museo delle Culture, Lugano, Switzerland). An analytical protocol based on microinvasive ATR-FTIR spectroscopy and non-invasive External Reflection FTIR (ER-FTIR) spectroscopy was employed. The ER-FTIR technique is rapid, portable, and widely employed in the cultural heritage field, but rarely applied to the study of textiles. The ER-FTIR band assignment for silk was discussed for the first time. The obtained data are a part of a challenging work of characterisation of the majority of ancient materials in armours, which is a never made before project. Data have been interpreted with the help of peak fitting analysis and chemometric elaboration with PCA.

ATR-FTIR spectroscopy permitted to give clear indications about the decay condition of silks, thus giving the opportunity to discriminate original and restoration materials. In particular, the region of amide I and II bands was studied in order to obtain conformational information about silk proteins, which could be related to different decay stages. An indication of the decay status of the silk yarn was hypothesized by observing the shift of the amide I peak.

Another issue of interest was the detection of degumming. This process is generally applied to eliminate sericin from the fibroin core; the obtained fibre is named soft silk, in contrast with hard silk which is unprocessed. The distinction between hard and soft silk could give both historical information and useful indication for informed conservation. ER-FTIR spectra, evaluated in the OH stretching region, allowed a reliable distinction between hard and soft silk, allowing to overcome the difficulties in detecting hard silk which are typical of ATR-FTIR spectroscopy.

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