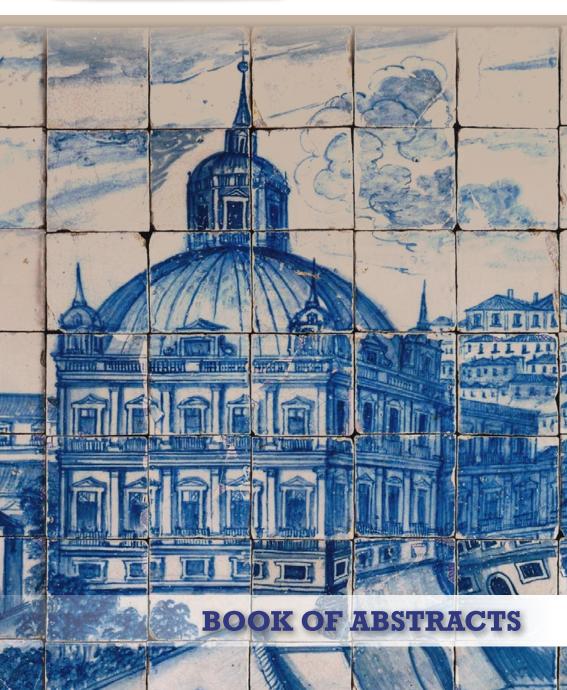


International conference on analytical techniques in art and cultural heritage

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TECHNICAL INFORMATION

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NOTE

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		I BUILDING C3 - AUDITORIUM 3.2.14
O9hO0	N H - 1	TEXTILES CHAIRED BY PAULA NABAIS Diego Tamburini
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09h45	1470	Allessia Melelli, Camille Goudenhooft, Loren Morgillo, Sylvie Durand, Johnny Beaugrand, Anita Quiles, Timm Weitkamp, Mario Scheel, Fréderic Jamme and Alain Bourmaud Cutting-edge techniques for the investigation of ancient flax textiles
10h00	1682	Constantina Vlachou-Mogire, Moira Bertasa, John R Gilchrist, Jon Danskin and Kathryn Hallett Historic tapestry dye analysis with hyperspectral imaging
10h15	3848	Hortense de La Codre, Rémy Chapoulie, Laurent Servant and Aurélie Mounier A comprehensive methodology for the characterisation of 18th-century tapestry dyeing materials: between point analyses and hyperspectral imaging
10h30	5773	<u>Pauline Claisse</u> , Francesca Galluzzi, Floréal Daniel, Rémy Chapoulie, Mohamed Dallel and Aurélie Mounier SWIR hyperspectral imaging to unveil the numerous restorations of the Lady and the Unicorn tapestry (15th C, Musée de Cluny)

Analytical investigation into cellulosic materials from traditional Japanese samurai armours

Ludovico Geminiani^{(1)*}, Cristina Corti⁽²⁾, Moira Luraschi⁽³⁾, Sila Motella⁽⁴⁾, Laura Rampazzi⁽²⁾

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The presentation aims to show limits and possibilities of ATR-FTIR spectroscopy applied to the study of cellulosic textiles collections. The work discusses some common issues and offers some hints for the interpretation of ATR-FTIR spectra from cellulosic textiles collections.

The spectral differences derived from the plant composition were reviewed and discussed in light of new experimental data, to propose diagnostic bands able to discriminate fibres coming from different plants. Similarly, the influence of the environmental humidity uptake was studied through water absorption tests and peak fitting analysis [1,2]. The contribution of ageing [3] was also considered and replicated through accelerated ageing tests, demonstrating that sometimes aged fibres cannot be reliably recognized. Thus, the visual inspection through SEM, which is relatively non-invasive, is still often decisive in recognizing natural fibres. The proposed protocol was tested on microsamples of various materials coming from traditional Japanese samurai armours dating back from 16th to 20th century (Morigi Collection, Museo delle Culture, Lugano, Switzerland). A part of the work was devoted to the study of metallic threads, a complex and unique multimaterial with specific characteristics in Japanese tradition (*kinran*) which has been characterized for the first time.

The results permitted to get a complete characterization of the materials and demonstrated that the protocol can be useful for the study of a wide variety of cellulosic materials, including fibres, and paper. It was found that it is possible to discriminate natural and regenerated cellulosic fibres, thanks to the OH stretching region, which is the most diagnostic. The method is micro-invasive, quick and simple to use during an analytical campaign on a textile collection and it permits to identify both ancient natural and recent regenerated fibres. The information is of a great help to find out past restoration materials and to reconstruct the history of the work of art. As modified cellulose fibres appeared in 20th century, the recognition of chemical modifications operated on the fibre gives a certain *terminus post quem* for dating or a clear sign of a recent restoration. Eventually, the knowledge could help to find out the best conditions to display objects and to stabilise them for long-term storage.

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- [3] Małachowska E, Dubowik M, Boruszewski P, Przybysz P. Accelerated ageing of paper: effect of lignin content and humidity on tensile properties, "Herit Sci.", 9, 2021, pp. 1–8.