Testa di Porticello – V sec. a.C.

DALLA CONOSCENZA ALLA VALORIZZAZIONE:
IL RUOLO DELL'ARCHEOMETRIA NEI MUSEI

ASSOCIAZIONE ITALIANA DI ARCHEOMETRIA
CONVEGNO TEMATICO

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IPCF — Istituto per i Processi Chimico Fisici

Combining OCT and NMR-MOUSE techniques to study the stratigraphy of historical violins: the *thickNESS* project

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In this work, Optical Coherence Tomography (OCT) and Nuclear Magnetic Resonance (NMR-MOUSE) have been applied to precious historical violins made by the most renowned makers of the Italian lutherie, such as Amati, Stradivari and Guarneri 'del Gesù', and hosted in the Museo del Violino in Cremona. Several large fragments removed during past restorations from instruments produced by the luthiers Stainer, Gasparo da Salò, Maggini and Guadagnini, as well as laboratory models simulating musical instruments stratigraphy, were further examined. OCT study was carried out with a prototype high-resolution portable SdOCT instrument providing layer thickness measurements and information about the presence of particles, cracks and delaminations. NMR analyses were performed with a Magritek Kea spectrometer and a Profile NMR-MOUSE (PM5) giving information on the wood density and elasticity, the last one possibly related to adopted treatments. The analyses have been conducted within the MOLAB Transnational Access - EU H2020 Project IPERION CH (thickNESS Project).

Data interpretation is still in progress and promising results are expected to reveal in-depth insight into the finishing violin making process. These outcomes will be integrated with the results from UVIFL, FT-IR, Raman and XRF techniques in order to set up a methodology which allowed researchers to non-invasively characterize the stratigraphy of historical violins.
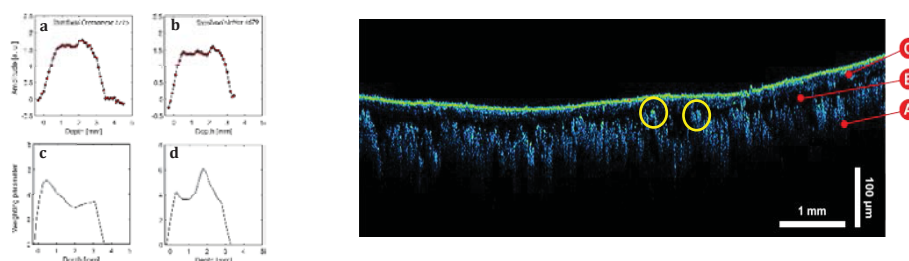
Left: NMR depth profiles from the Cremonese (a,c) and Hellier (b,d) violins. The NMR signal amplitude (a,b) is governed by the wood density; the weighting parameter (c,d) is governed by the material properties, most importantly elasticity. **Right**: OCT tomogram of a fragment by Gasparo da Salò. The wood substrate A, the varnish layer B and the external layer C are shown. Particles embedded are highlighted in yellow.

References

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