

Introduction to the OCT technique

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In this contribution the Optical Coherence Tomography (OCT) technique will be presented. Firstly, for audience not familiar with this analytical method, a brief introduction will be given and the physical background will be explained at non-specialist level.

Specifically, two essential configuration of OCT systems:

- Time domain OCT
- Fourier domain OCT (further specified as Spectral domain OCT or Swept Source OCT)

will be described with the emphasis on advantages and disadvantages of these configurations for specific tasks within examination of cultural heritage object.

Then the major parameters of the OCT instruments will be defined:

- axial resolution,
- lateral (in-plane) resolution,
- spectral properties of the probing light (central wavelength and bandwidth),
- power of light at object,
- imaging range,
- sensitivity,
- time of examination.

and discussed with emphasis on their importance for applications in art conservation/restoration practice.

Then the data acquisition protocols and modes of presentation will be discussed.

Using examples from model as well as real objects a key for interpretation of OCT tomograms will be given and exemplary tomograms will be discussed including common distortions and other artifacts of OCT imaging. Among others it will be shown how to distinguish scattering and absorbing layers, find a metal foil layer in the structure, and differentiate a distortion of layer structure caused by light refraction from a real one.

Finally, an overview of applications to be presented in further lectures will be given.

REFERENCES

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