

Combined Analysis of thin structures: how to characterise their structure, texture, stress state, nanocrystals, phase and more in a global approach

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The 10-years old methodology called Combined Analysis using rays (x-rays, neutrons, electrons) has proved its efficiency in particular in the field of thin architectures characterization. Not only it avoids false minima in the refinements of film characteristics when e.g. texture or structure is the only targeted aspect, but it also allows to benefit from thin structure's anisotropies rather than to suffer for them during characterizations.

We illustrate in this presentation:

- the quantitative determinations of texture, microstructure (anisotropic nanocrystal sizes and microstrains), structure, residual stresses, phases on complex examples of thin structured layers using x-ray diffraction,
- the actual developments of the methodology, noticeably concerning the use of TEM rings patterns
- some milestones about the future developments