Synchrotron, lab-scale and industrial X-ray tomography for multiscale structural integrity

Mini-symposium, 1st Biennial ECIS – CSIC Conference on Structural Integrity (BECCSI 2025)

Belgrade, Serbia, 25 – 28 November 2025

https://www.beccsi2025.com/

Organisers

Oleg Naimark, Institute of Continuous Media Mechanics, Ural Branch of Russian Academy of Sciences, Perm, Russia (naimark@icmm.ru)

Liaojun Yao, Department of Astronautics Science and Mechanics, Harbin Institute of Technology, China (l.yao@hit.edu.cn)

Stepan Lomov, Department of Material Engineering, KU Leuven, Belgium (stepan.lomov@kuleuven.be)

X-ray computed tomography (XCT) allows direct visualisation of the heterogeneous material, also damaged material, "from inside", on different structural and scale levels. The XCT hardware ranges from industrial and laboratory devices to use of synchrotron radiation.

Considering the needs of materials design for structural integrity, mere XCT visualization of the material is not enough. The design must be assisted with quantifying the visualized features and linking these features with the mechanical and functional performance, aiming at:

- Creation of a "digital twin" of the material, which reproduces the microstructural elements and defects with maximum possible precision, serving as a basis for constructing mechanical and physical models.
- Quantification of the microstructure, of the manufacturing defects and in-service damage.

The mini-symposium invites presentations on:

- XCT investigations of damage processes in different classes of materials (metals, ceramics, polymers, composites …);
- XCT characterisation of heterogeneous morphology, including defects and damage quantification;
- XCT experimental mechanics, including full-field 3D strain analysis;
- XCT methodology and image reconstruction;
- XCT visualisation methods;
- case studies of XCT for specific materials and damage modes;
- XCT-based models of materials and damage.

The symposium will include special presentations about SKIF synchrotron radiation facility (SRF SKIF | Siberian Branch of the Russian Academy of Sciences (SB RAS)).

The abstract template and the submission instructions: https://www.beccsi2025.com/authors-center/