

Double Tomography in situ experiments

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Abstract

This work aims to perform fast experiments by fully exploiting the dual-beam microfocus high-energy tomograph located at INSA-Lyon (France), with 2P-DVC exploring the radiographs taken simultaneously from two crossed tomograph lines. By having the second line orthogonal to the first one, the sensitivity in the out-of-plane direction of each line is enriched, further increasing the spatial resolution of the obtained kinematics compared to a single tomograph case. For this, a single initial volume is reconstructed with the Astra toolbox using radiographs from both lines after a precise calibration of the system geometry. Then, radiographs are acquired on the fly from both lines during the mechanical test. In a post-processing step, the difference between these radiographs and the volume reconstruction in both directions is minimized simultaneously with respect to kinematic parameters. The latest advances in this methodology will be presented with examples of experiments with fast phenomena, such as viscoelasticity or crack propagation, showing the current state of the implementation and usage at the MatéIS laboratory.

Keywords:

X Ray Computed Tomography In situ experiments Digital Volume Correlation PDVC