Contribution ID: **47** Type: **not specified**

Localization of martensitic transformation in shape memory alloys: 3D spatial reconstruction by X-ray diffraction/scattering computed tomography.

The stress-induced martensitic transformation in polycrystalline NiTi-based shape memory alloys often tends to localize in bands on the macroscopic scale. In this contribution, we will present utilization of one recent tomographic technique - X-ray diffraction/scattering computed tomography (DSCT) - for spatial reconstruction of austenite–martensite transition zones in superelastic NiTi wires subjected to stretching and twisting. The obtained localization patterns will be discussed with respect to current computational simulations and micromechanical models.

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