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M2Or4C-03: Multiscale Mdelling of Niobium Sheets to Account for Anisotropic Evolution of Yield Surface and Plastic Potential

Tuesday, July 23, 2019 6:00 PM (15 minutes)

Multi-scale modelling was performed to account for the mechanical behavior of Niobium sheets. 3D representative volume elements (3D RVEs) were generated to properly account for the microstructure of the Niobium sheets. The effect of microstructure and constitutive model on the macroscopic behavior of single-crystal and polycrystal Niobium sheets was evaluated based on crystal plasticity finite element (CPFE) simulations. As for advanced phenomenological modeling in continuum scale, a two-yield surface plasticity based combined type isotropic-kinematic hardening law was utilized to account for the anisotropic evolution of yield surface and plastic potential in complex deformations. For demonstrations, numerical simulations of the stamping process for the Niobium sheets were performed by considering various constitutive laws.

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