

Simulation of Low Cycle Fatigue Behaviour of Nickel-Based Alloy at Elevated Temperatures

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Abstract : Thermal power machines are subjected to cyclic loading conditions under elevated temperatures. At these extreme conditions, the durability of the components has a significant influence. The material mechanical behaviour has to be known in detail for a failsafe construction. For this study a nickel-based alloy is considered, the deformation and fatigue behaviour of the material is analysed under cyclic loading. A viscoplastic model is used for calculating the deformation behaviour as well as to simulate the rate-dependent and cyclic plasticity effects. Finally, the cyclic deformation results of the finite element simulations are compared with low cycle fatigue (LCF) experiments.

Keywords : complex low cycle fatigue, elevated temperature, fe-simulation, viscoplastic

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