SM14L_12747

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Numerical Analyses of the Interaction Classical Plasticity – TRIP

Salem Meftah[(1)], Fabrice Barbe[(1)], Lakhdar Taleb[(1)], François Sidoroff[(2)]

(1) *INSA/LMR, St Etienne du Rouvray, France*
(2) *ECL/LTDS, Ecully, France*

The effect of classical plasticity on TRIP is analyzed considering martensitic transformation of ferritic steel. It is experimentally shown that TRIP is influenced by the previous strain hardening of the parent phase. This has been shown through tests consisting in significant strain hardening of the austenitic phase during cooling and before the metallurgical transformation occurs followed by the transformation without applied load. As the obtained results do not seem to be easily explainable in the light of the existing models in the literature, the objective of this paper is to contribute to a better understanding of the mechanisms at the origin of the observed discrepancies. For that, we consider in a first stage a classical finite element micromechanical approach already used (see for instance Ganghoffer et al., Mech. Of Mat., 1998). Having experiments as reference, the results show the essential role played by the choice of the numerical parameters.

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