

Master thesis!

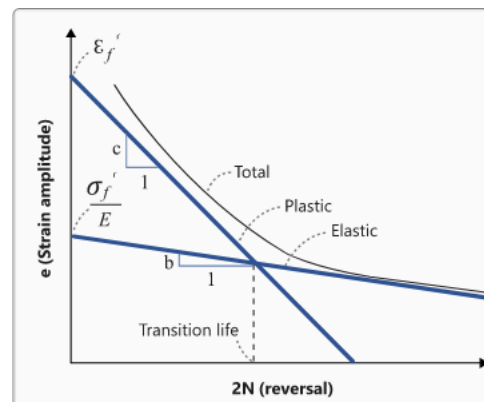
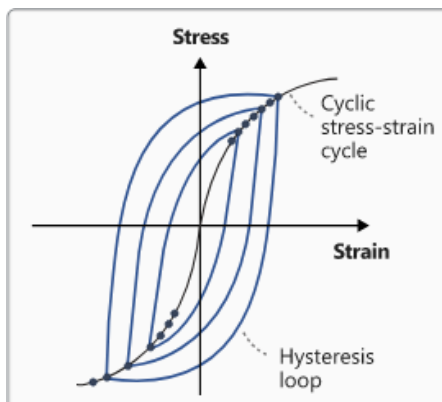
Lifetime Model for Steels with a unstable Stress-Strain Curve under variable amplitude loading

Motivation

Using a strain-based approach it is possible to describe the fatigue life by the damage model of Smith, Watson and Topper. Therefore, it is mandatory to describe the cyclic stress-strain curve by the relationship of Ramberg and Osgood. This works for steels with a stable hardening behavior. For steels with an unstable hardening behavior the approach must be improved by an additional function and a stepwise calculation. For constant amplitude loading this model work quite well. Within this master thesis the approach should be upgraded to variable amplitude loading. Hence, the order of the loads has to be considered.

Taks:

- Literature review to calculation model considering the load history
- Review of the existing experimental data and analysis of single data sets
- Development or adaption of a calculation model with non-constant cyclic stress-strain curve
- Implementation of the model into Matlab code
- Evaluation of the model using the existing experimental data
- Scientific poster as a summary of the thesis
- Documentation (Master thesis)



November 2024



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