



SS-2021-001-SM

Numerical Simulation of the Cracking Behavior of Reinforced Concrete Structures
(Numerische Berechnungen zur Rissbildung in Stahlbetonbauteilen)

Wide cracks in reinforced concrete structures allow corrosion of the reinforcement and thus have a negative influence on the durability. Simplified engineering models (e. g. Model Code 2010, DIN EN 1992) allow the prediction of crack width. However, due to the simplifications of the calculation model and the large number of influencing parameters, the calculated crack width is only to be understood as an approximation. Slight exceedances of the permissible crack width at the structure cannot be excluded.

In order to realistically represent the load-bearing behavior of reinforced concrete, all material non-linearities as well as the composite behavior between concrete and reinforcement bars must be taken into account. Finite element models offer one possibility for this.

Within the scope of the master thesis the following points should be worked out:

- Literature research
 - Nonlinear material models for numerical modeling of reinforced concrete
 - Numerical modeling of the composite between concrete and reinforcement
 - Possibilities of crack simulation
- Developing a FE-model to represent the crack behavior for a test recalculation
- Comparison of the test results with the results from the numerical calculation

Contact person: *Prof. Dr.-Ing. Steffen Marx*
Tel.: +49 351 463-35856
steffen.marx1@tu-dresden.de

Max Herbers, M. Sc.
Tel.: +49 351 463-39620
max.herbers@tu-dresden.de

