

Keeping track of the crack

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ABSTRACT

When modelling strain localizations with finite element discretizations and standard continuum models, generally mesh dependency is observed. The spatial discretization or mesh layout influences the numerical solution, and mesh objective energy dissipation of the fracture process cannot be guaranteed.

This issue is especially relevant when analyzing fracture processes in plain concrete and in concrete with low reinforced areas. Furthermore, it is relevant for detailed analyses of concrete specimens with small finite elements compared to the rebar diameters.

The title of this presentation refers to two interconnected issues: keeping track of the *width* of the localization zone and keeping track of the crack *propagation*.

Three recent research results of Arthur Slobbe will be presented:

- The relevance of proper localization *width* predictions, by showing results for a beam failing in shear.
- A new formulation to predict the localization *width* for cracks that are not aligned with the mesh lines.
- A crack tracking method for quadratic elements to control the crack *propagation*.

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REFERENCES

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