# Gradient-extended damage modeling with reduced integration-based continuum elements

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## ABSTRACT

Some years ago, a family of continuum finite elements based on reduced integration [1], [2], [3] was investigated. Many structural components with different kinds of elastic and inelastic material behaviour were considered and these elements showed accurate results while beeing more efficient than similar three-dimensional formulations based on full integration. The objective of the present contribution is to extend the analysis to damage and fracture. To this end we present the incorporation of gradient-enhanced damage models (similar to [4]) into the framework of continuum elements based on reduced integration. Aspects on stability as well as the implementation in analogy to fully-coupled thermomechanical problems are discussed within the talk. Numerical examples of quasi-brittle and ductile fracture reveal the simulation capabilities and accuracy of the proposed framework.

## REFERENCES

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