

# Stochastic damage process for fatigue analysis

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## ABSTRACT

Strongly scattered S-N data is often observed by engineering fatigue test [1]. To reproduce these uncertainties in the framework of continuum damage mechanics [2], it is here proposed to consider the kinetic damage evolution as a stochastic process [3]. In order to provide probabilistic fatigue life information for the engineering structures, robust and efficient numerical approaches are needed. Indeed, enormous sampling paths of the process and large time scale for each path shall be tackled by the implementation of this approach.

In this presentation the numerical schemes to solve the evolution equations within a finite element procedure will be exposed. The capability of the proposed approach in predicting the fatigue life will be discussed in comparison with experimental results. In addition, a parametric study and finite element computation results for two-dimensional applications will be shown.

## REFERENCES

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- [3] Woo, C. W., and D. L. Li. "A general stochastic dynamic model of continuum damage mechanics." *International journal of solids and structures* 29.23 (1992): 2921-2932.