



# Reliability assessment using combination of polynomial chaos and simulations: application to nonlinear fracture mechanics

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Auteur	Riahi, Hassen [1], Bressolette, Philippe [2], Chateauneuf, Alaa [3]
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Mots-clés	Nonlinear fracture mechanics [4], Polynomial chaos expansion [5], Quasi-Monte Carlo [6], reliability [7], sensitivity analysis [8]
Résumé en anglais	<p>This paper presents a probabilistic approach based on polynomial chaos expansion, in order to provide accurate explicit approximation of the structural response to be considered in the limit state function. The main difficulties in this approach are related to the calculation of the expansion coefficients which are defined by multi-dimensional integrals. As an alternative to the quadrature methods, Monte-Carlo simulations based on low discrepancy Halton sequence have been used for this issue. The accuracy and the efficiency of the proposed approach have been approved through analytical models. It is shown that the use of low discrepancy sequence provides more rapidly converging estimates. The proposed approach has been applied to assess the integrity of a cracked pipe.</p>
URL de la notice	<a href="http://okina.univ-angers.fr/publications/ua16361">http://okina.univ-angers.fr/publications/ua16361</a> [9]
Lien vers le document en ligne	<a href="http://pdf.blucher.com.br/mechanicalengineeringproceedings/10wccm/18746.pdf">http://pdf.blucher.com.br/mechanicalengineeringproceedings/10wccm/18746.pdf</a> [10].

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## Liens

[1] <http://okina.univ-angers.fr/h.riahi/publications>

- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27343>
- [3] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=27327>
- [4] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=23664>
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