

How reliable are computational predictions in the engineering sciences?

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Abstract

The presentation will address the notions Verification, Validation, Uncertainty and their relations to the reliability of the computational predictions. Specific examples in the solid mechanics will illustrate the mathematical, computational and engineering aspects of the reliability of the predictions. The examples will address also the role of experimental data, sometimes insufficient, in the formulation of the mathematical and computational problem and the assessment of the reliability of the predictions due to uncertainties in the available information.

References

- [1] I. Babuska and J.T. Oden, Verification and Validation in Computational Engineering and Science, Part1, Basic Concepts. Computer Methods in Applied Mechanics and Engineering, 193, pp 4047-4066, 2004.
- [2] I. Babuska and J.T. Oden, The Reliability of Computer Predictions: can they be trusted? International Journal of Numerical Analysis and Modelling, pp 253-273, 2006.