Uncertainty and Risk Modelling in Large Physical-Numerical Models

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Résumé :

Probabilistic risk assessment is developing as a means of decision-support for the design and regulation of industrial and natural risk control, requiring a description of uncertainty coupled with growingly-complex physical-numerical models. A number of issues are raised as to the need for robust and accountable modeling of the low probabilities associated: specifying a generic mathematical framework applicable to a large variety of industrial case studies; computing of double-level probability distributions on the outputs of a complex numerical function, including the robust control of the error estimates and associated probabilistic and computational issues; estimating the model input distributions through probabilistic inversion of physical-numerical models; developing the use of High Performance Computing.