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**Mastering uncertainty in industry. I: A global methodological approach based on examples. (La maîtrise des incertitudes dans un contexte industriel. I. Une approche méthodologique globale basée sur des exemples.)** (French. English summary) [Zbl 1409.62256](#)  
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Summary: An industrial decision process supported by quantitative modelling (safety and reliability, physical design of facilities or processes, economic optimisation, environmental impact, etc.) quickly faces a wide diversity of uncertainties, imprecisions, errors or randomness affecting all data or models. Through four introductory examples that summarise years of industrial practice in different sectors, this paper evidences that a generic and applied approach to uncertainty in industry can surpass a terminological heterogeneity that is largely explicable by the historical separation of the fields involved (such as metrology, reliability, statistics, numerical analysis, ...). In relation with the applicable regulation and standards and a relevant decision criterion (step A), this approach involves in particular the proper identification of key steps such as: the quantification (or modelling) of the sources of uncertainty (step B), possibly involving an inverse approach (B'), their propagation through a pre-existing physical-industrial model (step C), the ranking of importance or sensitivity analysis (step C') and sometimes a subsequent optimisation step. A review of the corresponding statistical, physical and numerical methods is the subject of a second part following the present paper. This approach is intended to be amenable to a variety of underlying epistemological choices, including the tricky choice of differentiating the modelling according to nature of uncertainty. It aims at giving a consistent and industrially-realistic framework for practical mathematical modelling, assumingly restricted to quantitative and quantifiable uncertainty, a domain of considerable recent interest from the industrial sector.

**MSC:**

**62P30** Applications of statistics in engineering and industry; control charts  
**62-02** Research exposition (monographs, survey articles) pertaining to statistics

Cited in **1** Review  
Cited in **1** Document

**Software:**

[bootstrap](#)

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