

SPECIAL SESSION PROPOSAL

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Title	Methodology, tools, and software for dealing with imprecision in risk analysis
Topic and/or industrial area of the special session	Aeronautics and Aerospace Civil Engineering Critical Infrastructures Manufacturing Maritime and Offshore Technology Natural Hazards Nuclear Industry

<p>Description of the subject</p>	<p>Classic risk analysis often required the full characterisation of probabilistic model for describing the hazards and potential consequences in order to quantify the level of safety of engineering systems. In practice, this requires some significant assumptions and simplification making the analysis less credible.</p> <p>This special session focuses on emerging methodologies, innovative tools, and advanced software solutions aimed at addressing imprecision in risk analysis. Imprecision, arising from incomplete or uncertain data, presents a significant challenge in assessing risks within complex systems. The session invites contributions that explore cutting-edge techniques such as probabilistic methods, interval analysis, fuzzy logic, and imprecise probabilities. We also encourage submissions on software development and computational frameworks designed to handle uncertainty in real-world applications, including engineering, infrastructure, and safety-critical systems. The goal is to foster collaboration and knowledge sharing among academics, industry practitioners, and software developers to enhance the accuracy and reliability of risk analysis under uncertainty.</p>
<p>Motivation of the proposal</p>	<p>Imprecise reliability analysis is much more involved than its purely aleatoric counterpart. Thus, there is a need for development of novel methods for uncertainty quantification involving aleatoric and epistemic uncertainty that are numerically efficient.</p>
<p>Objectives of the proposal</p>	<p>The aim is bringing together the latest developments on approaches, tools and software for imprecise reliability analysis. The scope covers: novel formulations for coping with aleatoric and epistemic uncertainty; advanced simulation methods; development and application of surrogate models, etc.</p>
<p>Peculiarities of the special session with respect to a regular session on the same topic and/or industrial area</p>	<p>Regular sessions focus on the topic of structural reliability considering classical probabilistic analyses. The proposed special session extends on this issue by addressing both aleatoric and epistemic uncertainty and their implication or risk analysis.</p>