

BET_VR: a probabilistic tool for long-term volcanic risk assessment

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We present a new methodology that extends the concept of Bayesian Event Tree to the quantitative assessment of Volcanic Risk (BET_VR). New nodes (levels) of analysis are added to the BET_VH structure (Bayesian Event Tree for Volcanic Hazard), accounting for the vulnerability and exposure levels. In particular, the goal of this approach is to provide the assessment of risk curves (the exceedance probabilities for different levels of losses) accounting for the uncertainties (both aleatory and epistemic) in hazard and fragility assessments, loss evaluation and exposure.

Here, we present a preliminary application to the direct monetary risk related to tephra fall in Naples. In particular, we selected several areas of Naples for which fragility models and census databases are available. In these areas, the hazard assessment for tephra fall from Mt. Vesuvius and Campi Flegrei is considered, and coupled to vulnerability and exposure assessments. As a result, both risk curves and expected values are evaluated, propagating epistemic uncertainties from the very beginning (eruption probability) to the very end (losses due to damages) of the assessment.

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