

LOSSVAR

Assessing effect of Local SubSoil VARIability and Uncertainty in SSI

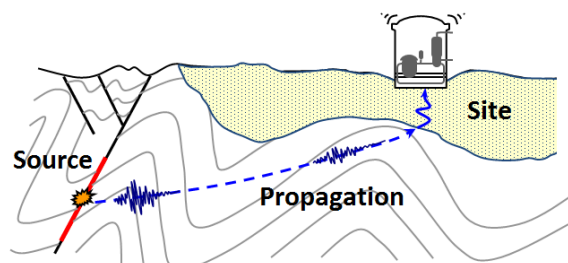
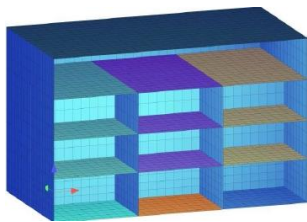
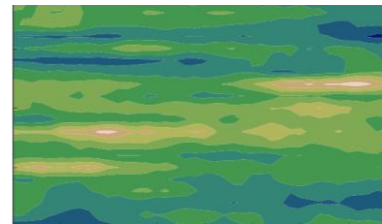
OBJECTIVES

The accurate modelling of soil properties and soil-structure interaction (SSI) are an important issue for the seismic margin and safety assessment of industrial plants and critical infrastructures. Concurrently, it has been shown in the past that the spatial variability may have a major impact on extended and multi-supported structures. The objectives of LOSSVAR are:

- to implement probabilistic numerical soil-structure interaction models accounting for soil spatial variability
- to evaluate the impact on the expected seismic margin and safety factors in probabilistic risk assessment

DESCRIPTION OF WORK

LOSSVAR will develop probabilistic numerical SSI models and evaluate the impact of spatial variability and uncertainties on the expected seismic margins and safety factors in probabilistic risk assessment. The proper distinction of random spatial soil variability and epistemic uncertainty is one of the keys to reduce epistemic uncertainty in the performance based assessment of plant safety. The project approach is based on numerical and laboratory experiments and code benchmarking for V&V.



MAIN RESULTS / HIGHLIGHTS

- Development of stochastic soil model based on analytical solutions of 3D Karhunen-Loève decomposition for improved efficiency and robustness. Validation with respect to coherency function of literature.
- Software implementation and case studies made available to public through open source simulation platform SalomeMeca.
- Benchmarking of different codes to assess and validate simplified methodologies
- Experimental tests at reduced scale at the University of Brighton

DURATION

1 March 2015 – 31 August 2016
18 months

PARTNERS

EDF, IMSIA (F), UoB (UK), SPI (D)

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