

MODELLING SPATIAL VARIABILITY AND UNCERTAINTY IN SITE CHARACTERISATION FOR GEOTECHNICAL APPLICATIONS

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ABSTRACT

The purpose of site characterisation (in the context of geotechnical engineering, geo-hazard studies, hydrogeological and environmental assessment, etc.) is to establish reliable geological and geotechnical models based on site and laboratory investigations. Site characterisation usually involves significant spatial variability, transformation uncertainty, and statistical uncertainty related to soil/rock properties as well as spatial/temporal variability related to environmental parameters. Since the sixties, geostatistical methods, random field theory, and several other models have been developed to model these spatial/temporal variabilities and uncertainties.

More recently, data-driven methods (e.g., Bayesian, neural network, fuzzy methods, machine learning algorithms, etc.) have also been adopted to model these variabilities and uncertainties. This session is aimed at presenting and discussing novel methods of modelling spatial variability of soil/rock properties, spatial/temporal variability of environmental parameters, uncertainty of site investigation techniques, transformation uncertainty, and statistical uncertainty. The roles of site-specific data, regional-specific data, and global databases are also of interest.

In addition, will be appreciated all those contributions dedicated to applications of the above-mentioned modelling to safety evaluations of geoengineering structures as well as developing reliable territorial management, especially to natural risk assessment and mitigation under extreme events due to climate changes.

Thus, all the contributions focused on the above mention topics are warmly welcomed.