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Reliablity analysis of gravity dams by response surface method

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A dam failure is one of the most important problems in dam industry. Since the mechanical behavior of dams is usually a complex phenomenon existing classical mathematical models are generally insufficient to adequately predict the dam failure and thus the safety of dams. Therefore, numerical reliability methods are often used to model such a complex mechanical phenomena.
Thus, the main purpose of the present paper is to present the response surface method as a powerful mathematical tool used to study and foresee the dam safety considering a set of collected monitoring data. The derived mathematical model is applied to a case study, the Moste dam, which is the highest concrete gravity dam in Slovenia. Based on the derived model, the ambient/state variables are correlated with the dam deformation in order to gain a forecasting tool able to define the critical thresholds for dam management.