

# A Concrete Arch Dam Under Seismic Loading Conditions

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## Abstract

A new regulation for the safety assessment of dams has just been developed in Italy and its approval process is still in progress. As a matter of fact the behaviour of dams under seismic loading conditions is deemed of actual interest due to the recent seismic events occurred. In earthquake analysis, some of the most challenging aspects dam engineers have to deal with are: the capability to take duly into account the dam-reservoir and foundation rock-reservoir interactions; a careful evaluation of the maximum displacements/stresses of the concrete structures; a proper choice of constitutive models as well as the type of numerical analysis to be carried out depending on the severity of the earthquake to be considered.

This paper will show how COMSOL Multiphysics® could afford the safety assessment of a large concrete arch dam under dynamic excitation, taking into account the dam-reservoir and foundation rock-reservoir interactions as well. In particular, a time domain and a frequency domain analysis will be carried out and results will be compared in terms of displacements/stresses, highlighting which are the capabilities of each approach.