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Seismic ground motion evaluation in the Valais: modeling and response spectra

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In the frame of the SISMOVALP (Seismic Hazard and Alpine Valley Response Analysis) project, ground motion measurements, 2D-modelling and local hazard computations have been carried out for the Valais, the region with the highest seismic hazard in Switzerland. Here, we will focus on modelling aspects, computation of site response spectra and hazard spectra for 5 towns in the deep sediment-filled Rhone valley: Sion, Sierre, Visp, Martigny and Monthey. In order to evaluate amplification effects at these sites, 3 types of models had been used as inputs for seismic response simulations: a so called layered reference model M0 which is a general and realistic representative alpine valley that summarizes the main features detected in different alpine valleys under study; the 'Vetroz' and the 'Martigny' models representing the geology of the central/eastern (Sion, Sierre, Visp) and western part (Martigny, Monthey) of the Rhone valley, respectively. The seismic response is being computed by the use of the direct boundary element method (DBEM). The transfer functions as well as the time series obtained are discussed for different sites of these models in the scope of studying specific seismic site response in this type of valleys. The simulation outputs are also convolved with strong motion records (for hazard-characteristic magnitude-distance pairs) produced by stochastic simulation and downloaded from the European strong motion database. The results are compared with the regional hazard in terms of response spectra for rock and the specific sites.