



## **Slip-rate variability along strike active faults: Implications for seismic hazard assessment and mapping**

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The rate at which a fault slips fundamentally determines the seismic hazard because average earthquake recurrence intervals tend to decrease as slip rates increase. Based on slip-rate data and the fault geometry we can extract recurrence intervals for specific earthquake magnitudes in order to use them as input data for Poisson and time-dependent probabilistic studies.

However, it is important to note that slip-rates vary along the strike of individual faults exhibiting higher values towards their center, which diminish towards the fault tips. Herein, we present several field examples, which demonstrate this along strike slip-rate variability. Examples include faults from the central Apennines, the southern Apennines and the Gulf of Corinth. For example, at the NW end of the Vallo di Diano Fault in the southern Apennines, there is a spectacular continuous post-glacial bedrock scarp that systematically decreases in height towards the fault tip. Scarp profiles were constructed, showing a gradual decrease in the postglacial throw from 8m to 7.3m and 3.3m as approaching the fault tip. A similar example concerns uplifted marine terraces in the footwalls of the Aigion and the South Alkyonides faults, which gradually decrease in elevation as displacement tapers off to zero at the fault tips.

This slip-rate variability has important implications for the seismic hazard assessment and can lead to different slip-rates been proposed for the same fault if for example trench sites or scarp profiles are constructed at different positions relative to the point of maximum displacement along a fault. These examples show that a slip-rate value extracted close to the fault tip, will underestimate the hazard posed by the fault,

whereas a slip-rate value extracted close to the center of the fault, will most probably overestimate the hazard close to the fault tips. We will discuss methods that allow conversion of variable fault slip-rates into seismic hazard assessments for such faults.