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# Towards a Fault-based SHA in the Southern Upper Rhine Graben

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A brief overview at a seismic map of the Upper Rhine Graben area (say between Strasbourg and Basel) reveals that the region is seismically active. The area has been hit recently by shallow and moderate quakes but, historically, strong quakes damaged and devastated populated zones. Several authors previously suggested, through preliminary geomorphological and geophysical studies, that active faults could be traced along the eastern margin of the graben. Thus, fault-based PSHA (probabilistic seismic hazard assessment) studies should be developed.
Nevertheless, most of the input data in fault-based PSHA models are highly uncertain, based upon sparse or hypothetical data. Geophysical and geological data document the presence of post-Tertiary westward dipping faults in the area. However, our first investigations suggest that the available surface fault map do not provide a reliable document of Quaternary fault traces. Slip rate values that can be currently used in fault-PSHA models are based on regional stratigraphic data, but these include neither detailed datings nor clear base surface contours.
Several hints on fault activity do exist and we have now relevant tools and techniques to figure out the activity of the faults of concern. Our preliminary analyses suggest that the LiDAR topography can adequately image the fault segments and, thanks to detailed geomorphological analysis, these data allow tracking cumulative fault offsets. Because the fault models can therefore be considered highly uncertain, our coming project for the next 3 years is to acquire and analyze these accurate topographical data, to trace the active faults and to determine slip rates through relevant features dating. Eventually, we plan to find a key site to perform a paleoseismological trench because this approach has been proved to be worth in the Graben, both to the North (Wörms and Strasbourg) and to the South (Basel). This would be done in order to definitely prove whether the faults ruptured the ground surface during the Quaternary, and in order to determine key fault parameters such as magnitude and age of large events.