A Web Tool for Interactive Generation and Visualization of Synthetic ShakeMaps

Marius Kriegerowski\textsuperscript{1}, Danijel Schorlemmer\textsuperscript{1}, Thierry Goubier\textsuperscript{2}, and Fabrice Cotton\textsuperscript{1}

\textsuperscript{1}Helmholtz-Zentrum Potsdam Deutsches GeoForschungsZentrum GFZ
\textsuperscript{2}Saclay Nuclear Research Centre

Synthetic shaking-intensity maps provide the necessary information about the detailed shaking distribution for scenario-based seismic risk assessment as well as post-disaster rapid loss estimates. These ShakeMaps allow to identify areas heavily affected by an earthquakes and are becoming, combined with an exposure/vulnerability model, the underlying data for a risk or loss model. Such computations deliver decision makers the data for informed policy decisions for precautionary measures for increasing resilience, or, in case of post-disaster analyses, rapid estimates for disaster mitigation.

We present a new web engine for synthetic ShakeMaps harnessing the OpenQuake engine of the Global Earthquake Model (GEM) foundation. The back-end asynchronously digests requests parameterizing earthquake sources in terms of source depth, epicentral location, moment magnitude and focal mechanism. The back-end returns shaking in user definable ground-motion measures (e.g. PGA or IMS) and can be retrieved in various formats such as ASCII, GeoJSON, among others. This tool implements an open and documented API that users and other services can query systematically and automatically. It integrates into the LEXIS framework, a Horizon 2020 funded project aiming at improving rapid loss assessments and emergency decision support systems.

An interactive interface allows to explore the expected shaking in the spatial domain by selecting locations of interest on a map and defining the earthquake source interactively within a web browser. Besides the interactive mode, this service now provides, through HTTP requests, a simple interface for any type of ShakeMap to be used in automated systems that require rapid ShakeMap computations without the need to run local instances of OpenQuake.