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Seismic hazard assessment of the Kivu rift segment based on a new seismotectonic zonation model (western branch, East African Rift system)

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1     **Seismic hazard assessment of the Kivu rift segment based on a new**  
2     **seismotectonic zonation model (western branch, East African Rift**  
3     **system)**

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16    **Abstract**

17    In the frame of the Belgian GeoRisCA multi-risk assessment project focusing on the Kivu  
18    and northern Tanganyika rift region in Central Africa, a new probabilistic seismic hazard  
19    assessment has been performed for the Kivu rift segment in the central part of the western  
20    branch of the East African rift system. As the geological and tectonic setting of this region is  
21    incompletely known, especially the part lying in the Democratic Republic of the Congo, we  
22    compiled homogeneous cross-border tectonic and neotectonic maps.

23  
24    The seismic risk assessment is based on a new earthquake catalogue based on the ISC  
25    reviewed earthquake catalogue and supplemented by other local catalogues and new  
26    macroseismic epicenter data spanning 126 years, with 1068 events. The magnitudes have  
27    been homogenized to Mw and aftershocks removed. The final catalogue used for the seismic  
28    hazard assessment spans 60 years, from 1955 to 2015, with 359 events and a magnitude of  
29    completeness of 4.4. The seismotectonic zonation into 7 seismic source areas was done on the  
30    basis of the regional geological structure, neotectonic fault systems, basin architecture and  
31    distribution of thermal springs and earthquake epicenters.

32  
33    The Gutenberg-Richter seismic hazard parameters were determined by the least square linear  
34    fit and the maximum likelihood method. Seismic hazard maps have been computed using

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