



ESTIMATION OF EARTQUAKE RISK CURVES OF PHYSICAL BUILDING DAMAGE

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In this study, a new approach to quantify seismic risks is presented. Here, the earthquake risk curves for the number of buildings with a defined physical damage state are estimated for South Africa and shown in Fig.1. Therein, we define the physical damage states according to the current European macro-seismic intensity scale (Grünthal, 1998). The vulnerability is modelled by using the damage functions according to Raschke (2004), while important elements of the hazard model are parameterized based on the results of Bejaichund (2010).

The advantage of such kind of risk curve is that its plausibility can be checked more easily than for other types. The earthquake risk curve for physical building damage can be compared with historical damage and their corresponding empirical return periods. The number of damaged buildings from historical events is generally explored and documented in more detail than the corresponding monetary losses. The latter are also influenced by different economic conditions, such as inflation and price hikes. Further on, the monetary risk curve can be derived from the developed risk curve of physical building damage. The earthquake risk curve can also be used for the validation of underlying sub-models such as the hazard and vulnerability modules.

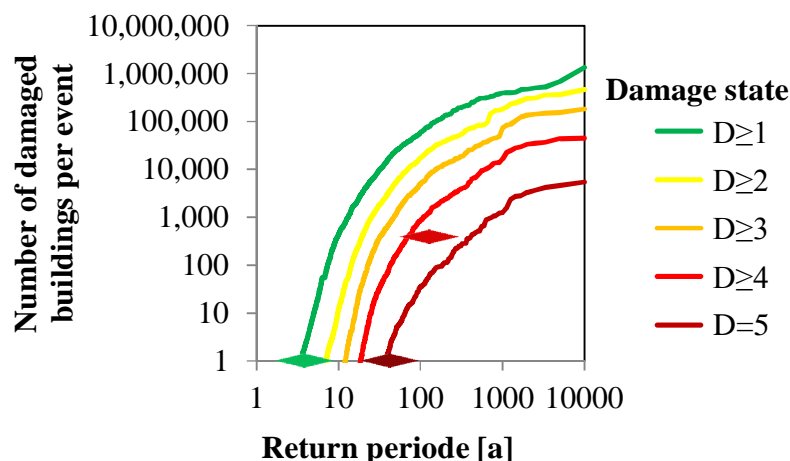


Figure 1. Estimated risk curves for South Africa (rhombuses: historical damage events and range of corresponding empirical return periods)

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