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# Reassessment of the maximum magnitude of strike-slip earthquakes

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What is the best approach of estimating the true maximum earthquake magnitude (Mmax)? This worst-case scenario can be defined as the less probable, never foreseen earthquake size but yet physically possible. Some authors have shown that earthquake observations are not sufficient to statistically estimate Mmax and that some long-term geological constraints should be used. We used as physical constraint the geometry of the fault network and its relation to the regional stress field. Criteria were then defined in a procedure - from the dynamic stress modelling literature - for estimating large cascading known faults into super-size fault lengths and then convert those into refined Mmax values. We developed an algorithm for multi-segment rupture and tested it on the strike-slip faults of the Anatolian Peninsula as defined in the 2013 European Seismic Hazard Model (ESHM13). We find that Mmax is increased locally from about 0.5 to 1.5 units along the North Anatolian Fault and the East Anatolian Fault. A number of other faults show an increase from about 0.5 to 1.0. With longer ruptures being characterized by greater slip and a wider shaking spatial footprint, our results infer a significant change in hazard for most of the Anatolian Peninsula once cascades are considered. Our algorithm is straightforward and does not require extensive calculations, which should make it a simple add-on to consider for improving future stress tests and other seismic hazard analyses.