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# Liquefaction risk analysis using disaggregation

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Probabilistic Seismic Hazard Analysis (PSHA) is one of the main tools used in seismic risk analysis. Throughout the years it has been used for the determination of Peak Ground Accelerations (PGA), uniform hazard spectra, and even liquefaction potential. Disaggregation is a powerful tool that allows understanding of the different contributors to the risk, in terms of magnitude, Mw and distance, R. It also allows attributing statistical weights to the various events (Mw,R) which lead to the attained exceedance value (for example PGA). Using disaggregation, one can choose suitable events for simulation (say by Monte-Carlo analysis) which will lead to the representative PSHA response. When calculating the factor of safety against liquefaction one must consider the earthquake magnitude (which allows scaling of the Cyclic Resistance Ratio, CRR, to magnitudes other than 7.5). Regional maps, which are based on PSHA disaggregation, for the calculation of the Magnitude Scaling Factor (MSF) are presented for the state of Israel. It is demonstrated that different sites may have significantly different MSF values and coefficients of variation, both are required to assess the probability of having a factor of safety smaller than one. The suggested maps may be seen as a rigorous alternative that eliminates the need to decide, arbitrarily, on a magnitude to be used in the scaling factor.