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Stochastic Modeling of Empirical Storm Loss in Germany

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Based on German insurance loss data for residential property we derive storm damage functions that relate daily loss with maximum gust wind speed. Over a wide range of loss, steep power law relationships are found with spatially varying exponents ranging between approximately 8 and 12. Global correlations between parameters and socio-demographic data are employed to reduce the number of local parameters to 3. We apply a Monte Carlo approach to calculate German loss estimates including confidence bounds in daily and annual resolution. Our model reproduces the annual progression of winter storm losses and enables to estimate daily losses over a wide range of magnitude.