



Earthquake risk perception, communication and mitigation strategies across Europe
Piero Farabollini, Francesca Romana Lugerì, Silvia Mugnano (Eds.)

A Collection of Statistical Methods for Analysis of the Disaster Damages and the Seismic Regime

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Abstract

In this paper, we present a collection of statistical methods addressing heavy tailed distributions. The empirical distributions of damage from natural disasters, both in terms of material losses and fatalities, are often modelled by theoretical distributions with a heavy power-law tail. The distribution of earthquake energy (seismic moments) is another example of such a heavy tailed distribution. The statistical methods that we discuss here allow to perform an analysis of empirical distributions at different levels depending on the amount of available data. We perform a detailed analysis of heavy tailed distribution using the theory of extreme values, and discuss the related examples. The presented methods of analysis of heavy tailed distributions constitute a toolbox, which can be useful in a number of practical applications.

Keywords: disaster related damage; power-law distribution, heavy tailed distribution; theory of extreme values; seismic regime.

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