Mutual association of macroseismic effects based on the epicentral distance: a statistical analysis

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We developed a procedure for the encoding and the computer analysis of the macroseismic effects deduced from historical sources that allow the complete formalization of the process of the seismic intensity assessment. In particular we archived as alphanumeric codes the macroseismic information (i.e the texts representing effect descriptions) decomposed in 5 main syntactic elementary components. Presently our database includes more than 33000 effects relative to 8 significant Italian earthquakes of the last two centuries. The available encoded database allows a rigorous statistical analysis of the mutual association of macroseismic effects based on the epicentral distance. This association was never tested previously using rigorous statistical approaches for macroseismic scales that are based only on a qualitative comparison of the different effects and on empirical criteria. This approach would be useful also to define the characteristics of a new macroseismic scale.