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Assessing the seismic parameters of 19th century earthquakes in the Western Gulf of Corinth

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In the framework of the ANR-SISCOR project, a multidisciplinary investigation is in progress to improve the knowledge on the seismicity and characterize the seismogenic sources in the western part of the Gulf of Corinth (Greece).
A complete reappraisal of the information on the past earthquakes (1000-1899) has been carried out, retrieving the available studies and published data, and then going back to the primary, documentary sources. For the events of the 19th century, the investigation resulted in more than 100 new macroseismic data points. In this phase, particular attention was devoted to the retrieval of information on the location and features of earthquakes geological effects, such as liquefactions, landslides and tsunami waves.
From the new intensity distributions, location and magnitude of the four most important events of the 19th century have been reevaluated with both the Boxer and Bakun & Wentworth methods. The methods use the attenuation of intensity as a function of distance to derive earthquake parameters. For Boxer we used the intensity attenuation model derived for the Aegean area in the framework of the SHARE project. For Bakun & Wentworth we implemented three different regional intensity prediction equations (IPEs), two derived from recent earthquakes in Greece and one from earthquakes in the French Alps (an area with similar attenuation characteristics). We first tested the behavior of such IPEs against a set of recent earthquakes in the same area with instrumentally assessed parameters. The locations and magnitudes obtained for the historical earthquakes with both methods are consistent, although dispersion on the magnitude value is observed, depending on the used IPE. This variability is an expression of the epistemic uncertainty related to the assessment of the parameters of historical earthquakes.
The comparison of the obtained parameters with the distribution and type of the geological effects, together with the results of the geological investigation help constrain the link between the historical earthquakes and the active faults that produced them.