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Seismotectonics zoning of Morocco and adjacent region

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In the present work, a new seismotectonics zoning of the Morocco and adjacent region is proposed. It is supported on a new database including recent geological (active faults, slip rates, geometrical characteristics, chronology of some recent tectonic phases) and geophysical (both instrumental and historical seismicity, focal mechanisms, nature of the crust) studies. In addition, the geodynamic context of the convergence of the Africa-Europe plates in the area, going from the Atlantic Ocean to the Mediterranean Sea through the Strait of Gibraltar, has been taken into account. The newly suggested seismotectonics zoning is not limited to the borders of northern Morocco. It considers all the seismic sources (up to 400 km of distance) able to generate large and destructive earthquakes, such as the 1755 Lisbon earthquake, located in the Azores-Gibraltar transforming fault. New catalogues including the historical and instrumental seismicity since 1045 to 2005, and active faults were elaborated and used in this work. The most influential parameters having effects on the definition of the source area characteristics were determined with a suitable accuracy. The new performed zoning includes 12 shallow seismotectonics sources, each one corresponding to a certain volume of the Earth's crust, whose known data were used to determine its static and dynamic conditions. Each seismotectonics zone has been analysed and interpreted, presenting certain homogeneity in the seismic potential and mode of deformation, obtained from the seismicity data, the strain and the stresses. For zones including faults, we have specified the geometrical characteristics, the chronology of the different movements corresponding to the successive tectonic episodes, and the associated seismicity. This new zoning will provide an improved contribution for both future probabilistic studies on seismic hazard, determining the ground acceleration, and seismic risk in the north of Morocco.