Western Carpathian seismic events recorded in Poland

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The paper is based on a new Earthquake Catalogue for the Czech Republic, Poland and Slovakia, compiled in the framework of the Global Seismic Hazard Assessment Program. The catalogue, just under preparation to be published, represents up-dated, revised data set of all earthquakes which occurred prior to 1996. The events have been analyzed basing on source data, wherever it was possible (for all Polish quakes), to determine the epicentral data and their accuracies. Such a work has excluded earthquake duplications, which is a problem when dealing with historical earthquakes. The third level regionalization, based on this catalogue and general tectonic features, delineates Carpathian's region from the Polish — Slovakian frontier area: the Silesian region (11), Carpathian Foredeep (13), and Tatra Mts and Spiš region (14).

The Silesian region is located between the Sudetes and Carpathians where the Carpathians are thrust over the Bohemian Massif. Since 1774 seven earthquakes have been recorded, four of them with intensity between 6.5–7.5. This

region was exceptionally seismically active in the very short period of two years between 1785–1786. The epicenters of the well documented, strongest events are deep. The size of the shaken areas are relatively large and, consequently, the estimated foci correspond to the lower part of the Earth's crust. The focal depth of December 3, 1786 earthquake was 40 km.

Carpathian Foredeep — the seismic activity of the region is questionable. The earthquake catalogue includes two events but neither of these with sufficient accuracy. Kraków, in this location experienced a few times during its approximately 1000 year old history, the strong events of the Carpathians and Alps. For example, the vaulting of St. Catherine church in Kraków collapsed in 1443 during the earthquake with its epicenter in Central Slovakia. The evidence of local seismicity has not been confirmed by the seismological stations Kraków (KRA), which was in operation between the years 1954–1990, and Ojców (OJC) since 1990.

The Tatra Mts and Spiš region — the region comprises the most northern part of the Peripieninian Lineament. Over the last two centuries, 5 events with intensities 6–7 were recorded in Spiš — Pieniny Mts and in Podhale. The quakes are located along the Peripieninian Lineament. The depths of the events calculated from macroseismic data, as well as from instrumental data for events in 1995, are shallow, less than 5 km. In the years 1992–1993 there were recorded seismic events in the Beskid Sądecki Mts, where from seismic shocks are hardly known. There have been recorded two main earthquake sequences. The first one between June 28 and June 30, 1992, consisted of 3 foreshocks and 3 aftershocks. After 8 months, on March 01, there have been recorded 3 shocks: a main shock and two foreshocks. The main quakes of both the series have been widely recorded by European stations. The probabilistic approach to inversion problem was applied to determine the focal parameters together with error ellipses. Macroseismic data have been collected from 70 localities and macroseismic parameters of the two main shocks were determined. The source mechanisms have been calculated for 4 events. Analysis of the recorded seismic events allows to take some general geodynamical conclusions.