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The relationship of the global seismic activity with variations in the angular velocity of the Earth's rotation for 1720 - 2014 years

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It is known that the seismic activity (SA) of the Earth is unstable both in time and in space. Periods of increase in seismic activity alternate with periods of its decrease. The objective of this work is to analyze the spatial-temporal the distributions of the density of seismic events and relationship between the global CA and variations in the angular velocity of the Earth's rotation (AVER).
A density of the observed seismic events in the 1700-1895 years is several times less than in the period 1895-2014, so we carried out a separate analysis for both periods. To construct the spatial distributions of earthquake sources, we subdivided the Earth's surface into 18 latitudinal belts of 10° in extent. To analyze the temporal distribution, the entire observation period was subdivided into 5-year intervals and total number of events within each 5-year interval was calculated.
To prepare the working catalog of strong earthquakes for the period of 1700–1895, we used the catalog of considerable earthquakes on Earth since 2150 B.C. compiled by NEIC from the NOAA database. We extracted events with M>=7.5. The total number of events is equal to 72 (38 in the Northern Hemisphere and 34 in the Southern one).
Scatterplot for selected events (for latitude and time) and temporal distribution of events in five-year intervals were built. It is found that earthquakes to the north of latitude 60N and to the south of latitude 60S latitude were not observed. The Earth's SA has clearly expressed bimodal latitudinal distribution: two peaks in middle latitudes of the Northern Hemisphere (40°N–50°N) and the Southern Hemisphere (10°S–30°S), and the local minimum near the Equator.
The same analysis was carried out for period 1890-2014 years (period of instrumental observations) and the similar bimodal distributions were obtained.
The working catalog for the AVER for period 1720-2014 years was compiled on the basis of the world-known database IERS and data presented in the work [McCarthy, and Babcock, 1986]. The working catalog contains 590 observations (one observation per 6 months). To extract the low-frequency components of the AVER we used a band-pass filter for the frequency bands from 124 to 19 years. Then two time series: the temporal distribution of the seismic events and low-frequency components of the AVER were compared. For the first time it was found that SA maxima correspond to the final stage of the braking periods of Earth's rotation and the local minima of the SA correspond to the final stages of the acceleration of the Earth's rotation. Similar results were obtained for both observation periods (1700-1895, 1895-2014).
It was marked [Levin, Sasorova, 2015] a significant increase in the density of events at the beginning of the 20th century (1900 - 2015) and from 1875 to 1892 years. These periods correspond to the most significant periods of braking angular velocity of rotation of all the available observation period.
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