

Seismic activations in Turkey in the 17th – early 21st centuries and Kahramanmarash earthquakes on February 6, 2023

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Abstract The long-term seismic regime of Turkey for the 17th - early 21st centuries are analyzed. It is shown that the fundamental feature of the seismic regime is periodic seismic activations (SA) of strong earthquakes. During the analyzed period, 14 seismic activations of various durations (from 4 to 24 years) and a different number of events (from 4 to 22) were traced. The last SA in Turkey began in 2011, and most likely did not end with the Kahramanmarash earthquake in 2023. SA, as a rule, involves the main seismically active regions of the country (the Aegean coast, the North and East Anatolian faults), but with a clear dominance a certain seismically active area with reduced activity of others. An analysis of historical seismicity shows that strong earthquakes along the North and East Anatolian faults in many cases occur in the same source zones, confirming the concept of seismic sources as inherited geological structures, which may serve as an important prognostic symptom. The Kahramanmaraş earthquakes on February 6, 2023 occurred in the framework of the seismic activation that began in 2011. The position of the Kahramanmarash seismic source on the southern segment of the East Anatolian fault is in good agreement with displacement of seismic sources from north to south along this fault in the 20th century.

Keywords Earthquake, seismic regime, seismic activation, earthquake catalog, magnitude, intensity, Kahramanmarash earthquake, Turkey.

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