

MIDDAY ACTIVATION SEISMICITY IN TURKEY AND SEVERAL OTHER WORLD REGIONS

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Abstract. We analyzed the catalogs of weak seismic events in Turkey ($M \leq 4$) and several other regions of the world to identify the daily periodicity. It is shown that a well-marked predominance of seismic activity during the day in the neighborhood of noon, observed in the mainland Turkey and other regions of the world, may well be at least partly due to “contamination” of catalogs of weak seismic events from multiple explosions (produced mainly during the day) associated with production of the mining industry in these countries. Presence in the earthquake catalog of the human effect is confirmed by observation well-defined weekly periodicity of seismic events. Examples are given in the daily distribution of the number of seismic events separately for weak natural earthquakes and explosions for the regions where exist separate catalogs. It is considered that in the case of “cleansing” catalogs of seismic events from the explosions, the curve of the daily distribution of numbers of small earthquakes takes the standard for the vast majority of seismogenic areas in the world view: the number of small earthquakes occurring at night dominated by 15–20% over a number of them in the daytime. On the basis of general considerations and the known data in the literature it is assumed that strong earthquakes, by contrast, must predominantly take place during the day. Common cause of the observed (and expected) of the diurnal variations of numbers of earthquakes seems to trigger the excitation of strong seismic events due to sharp short-term (within 24 hours) changes in angular velocity of rotation of the Earth, and the corresponding redistribution of seismotectonic stress in the unstable non-equilibrium system of geological isolations (blocks) – from small groups of such individuals to large and back again.

Keywords: weak earthquakes, explosions, the daily periodicity, “noon effect”, “effect weekend”, anthropogenic “contamination” of earthquake catalogs.