



Evidence for Tidal triggering on the earthquakes of the Ionian geological zone, Greece.

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In this paper we investigate the tidal triggering evidence on the earthquakes of the seismic area of the Ionian geological zone in Greece using the Hi(stogram)Cum(ulation) method, which was introduced recently by Cadicheanu, van Ruymbeke and Zhu (2007). We analyze the series of the earthquakes occurred in the area which is confined by the longitudes 19 and 22 degree E and latitudes 36 and 40 degree N in the time period from 1964 up to 2008. In this time period 19916 shallow and of intermediate depth earthquakes with magnitudes ranging between 2.0 and 6.2 occurred. The great majority of the earthquakes, including those of $M \geq 5.0$, are shallow earthquakes. The result of our analysis indicate that the monthly variation of the frequencies of earthquake occurrence is in accordance with the period of the tidal lunar monthly and semi-monthly (Mm and Mf) variations and the same happens with the corresponding daily variations of the frequencies of earthquake occurrence with the diurnal luni-solar (K1) and semidiurnal lunar (M2) tidal variation. In addition the confidence level for the identification of such period accordance between earthquakes occurrence frequency and tidal periods varies with seismic activity, i.e. the higher confidence level corresponds to periods with stronger seismic activity. These results are in favor of a tidal triggering process on earthquakes when the stress in the focal area is near the critical level.

References

Cadicheanu, N., van Ruymbeke, M. and Zhu, P., 2007: Tidal triggering evidence of intermediate depth earthquakes in Vrancea zone (Romania), NHESS 7, 733-740.