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Evidence for Tidal triggering on the earthquakes of the Hellenic Arc, Greece.

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In this paper, continuing our program on investigating the potential tidal triggering mechanism on different areas of Greece, we investigate the tidal triggering evidence on the earthquakes of the seismic area of the Hellenic Arc using the Hi(stogram)Cum(ulation) method, which was introduced recently by Cadicheanu, van Ruymbecke and Zhu (2007). We analyze the series of the earthquakes occurred in the area which is confined by the longitudes 22^o and 28^o E and latitudes 34^o and 36^o N in the time period from 1964 up to 2010. In this time period 15,959 shallow and of intermediate depth earthquakes with ML up to 6.0 and 1,471 deep earthquakes with M_L up to 6.2 occurred. In accordance with our previous studies, the result of the present 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 variations. 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.