



Testing the recent Santorini seismic activity for possible tidal triggering effect

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Applying the Hi(stogram)Cum(ulation) method, which was introduced recently by Cadicaneau, van Ruymbecke and Zhu (2007), we analyze the series of the earthquakes occurred in the last 50 years in seismic active areas of Greece, i.e. the areas (a) of the Mygdonian Basin (Contadakis et al. 2007), (b) of the Ionian Islands (Contadakis et al. 2012) and (c) of the Hellenic Arc (Vergos et al. 2012). The result of the analysis for all the areas 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. Based on these results, we consider the confidence level of earthquake occurrence - tidal period accordance as an index of tectonic stress criticality for earthquake occurrence and we check if the recent increase in the seismic activity at the Santorini island complex indicate that the faults Kameni and Columbo (to which the seismicity is clustered) (Chouliaras et al. 2013) are mature for a stronger earthquake. In this paper we present the results of this test.

References

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