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A non extensive statistical physics view to the June 1995, Aigion earthquake (M6.2) aftershock sequence (West Corinth rift).

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On the 15th of June 1995 at 00:15 GMT, a strong earthquake of magnitude 6.2 occurred at the western part of the Gulf of Corinth (Greece). The earthquake was located at 38.37 N, 22.15 E (National Observatory of Athens), at about 12 km to the NNE of the city of Aigion, where 26 people were killed and many buildings suffered severe damages. The Gulf of Corinth region has long now been recognized as one of the most seismotectonically active areas in Europe (Ambraseys & Jackson, 1990; 1997), with an important continental N-S extension of about 13 mm/yr and 6 mm/yr at the west and east part respectively (Clarke et al., 1997a). This extension is expressed by important normal faults on the north and south margin of the basin of an E-W general direction, creating an asymmetric tectonic graben with the southern footwall being uplifted (Roberts et al, 1993; Armijo et al., 1996). The seismicity at the area includes 5 main earthquakes of magnitude greater than 5.8 since 1960.
In this study the spatiotemporal properties of the aftershock sequence that followed the main earthquake are being investigated. For this purpose two different catalogs were used, both containing the aftershocks detected at the first 17 days after the main shock. The choice of using in the analysis the two catalogs separately was made in order to see how the quality of the catalog affects the final results. The first catalog consists of 250 events recorded from the PAT Network (Tselentis et al., 1996) and the second of 326 events from the catalogs of the National Observatory of Athens (http://www.gein.noa.gr/). The aftershocks selected from both catalogs in the present study define an active zone of about 60 km E-W and 40 km N-S. No relocation of the hypocenters was performed. For each event, moment magnitude was calculated from ML for both catalogs according to the suggestions of Papazachos et al. (1997) and then the seismic moment according to the equation of Hanks and Kanamori (1979). The temporal distribution of aftershocks is well described by the modified Omori-law (e.g. Utsu et al., 1995). This law describes the temporal decay rate of the aftershock activity through the equation $n(t)=K/(t+c)p$, where n(t) is the number of events per unit time, t is the time since the mainshock and K, c, p are constants. From these parameters, the most important one is p, or else the p-value, which is a decay parameter that depends on the time interval of the rate decay n(t).
Furthermore, the applicability of a non extensive statistical physics (Tsalis, 2009) is tested, estimating the q-triplet which related with the frequency-seismic moment, the interevent time and the interevent distance distributions, respectively. Based on these estimations a discussion on the non-markovian character of Aigion earthquake aftershocks is given.

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