

# Non-extensive statistical physics analysis of earthquake magnitude sequences in North Aegean Trough, Greece

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## Abstract

In a recent study, Papadakis et al. (Physica A 456: 135–144, 2016) investigate seismicity in Greece, using the non-extensive statistical physics formalism. Moreover, these authors examine the spatial distribution of the non-extensive parameter  $q_M$  and show that for shallow seismicity, increase of  $q_M$  coincides with strong events. However, their study also reveals low  $q_M$  values along the North Aegean Trough, despite the presence of strong events during 1976–2009. Consequently, the present study further examines the temporal behaviour of parameters  $q_M$  and  $A$ , to reveal their relation with the evolution of the earthquake sequence. Through temporal examination of these parameters, we aim to show that the seismogenic system of the North Aegean Trough presents high degree of interactions after strong earthquakes during the studied period. Our findings indicate that increase of  $q_M$  signifies the existence of long-range correlations. If its value does not significantly decrease after a strong earthquake (i.e.  $M \geq 5$ ) then the studied area has not reached the state of equilibrium.

**Key words:** Tsallis entropy, seismicity, earthquake magnitude, North Aegean trough, Greece.

Full text is available at

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