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Scaling behaviour of aftershocks inter-event time of Al-Hoceima earthquake of February 24, 2004 (Morocco)

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Al Hoceima region (northern Morocco) was struck by an important earthquake (M ∼6.1) on February 24, 2004; inducing a devastating damage and 629 victims.

The aftershocks sequence following the main event (522 events with M ≥3 during 17 days) has been investigated by non-linear tools.

The inter-event time between successive aftershocks is analyzed to study the temporal fractal structure and clustering properties by means of: Omori and Korçak laws, Hurst analysis, fractal correlation dimension, autocorrelation function and coefficient of variation, etc.

From the Gutenberg-Richter law, the b value is found to be close to 1. The Omori law exponent is near 1.1. Fractal temporal correlation dimension is around 0.9, indicating a continuous and nearly uniform aftershock activity during this period, that is confirmed by the auto-correlation analysis and a high persistence behaviour from the Hurst analysis (H ∼0.75).

Investigating the aftershocks time structure, a moving window of 100 events shifted by 10 was used to follow the temporal variation of the Hurst exponent (0.64≤ H ≤0.84) and the statistical coefficient variation (0.86≤*cv*≤1.20) within the whole sequence. The results show a rather uniform persistence of inter-event times despite a low decrease of randomness degree indicated by *cv* fluctuation.

The temporal organization of the analyzed aftershocks sequence obeys power-law behaviour (scale-invariance), with high degree of persistence and uniformity (high cor-

relation of inter-event times and low clustering). This may put light on the rupture and fault geometry and characterize the underlying pattern seismicity in the region.