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Characteristics of Seismic Activity in the Western, Central and Eastern Parts of the North Anatolian Fault Zone, Turkey: Temporal and Spatial Analysis

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A b s t r a c t

Characteristics of seismic activity along the North Anatolian Fault Zone are analyzed between 1970 and 2010. Magnitude completeness changes between 2.7 and 2.9 in the North Anatolian Fault Zone. The frequency-magnitude distribution of earthquakes is well represented with a *b*-value typically close to 1. A clear decrease in temporal distribution of *b*-value is observed before the strong main shocks. Correlation dimension values are relatively large and the seismic activity is more clustered at larger scales in the North Anatolian Fault Zone.

A statistical assessment is made in order to detect the current seismic quiescence anomalies in the beginning of 2010. Eight significant anomalous zones throughout the North Anatolian Fault Zone are detected. These are centered at: (1) 41.08ºN-28.58ºE (around Silivri), (2) 41.47ºN-29.51ºE (in the Black Sea), (3) 40.69ºN-29.78ºE (including Izmit), (4) 40.26ºN-26.46ºE (around Gelibolu, Canakkale), (5) 40.59ºN-31.03ºE (including Duzce fault), (6) 40.86ºN-35.30ºE (around Amasya), (7) 39.48ºN-39.74ºE (around Erzincan), and (8) 39.06ºN-40.50ºE (around Bingol).

Key words: North Anatolian Fault Zone, seismic activity, fractal analysis, decluster, seismic quiescence.