

عنوان مقاله:

SPATIAL AND TEMPORAL ANALYSIS OF THE AFTERSHOCK SEQUENCE OF THE 21 MAY 2003 ZEMMOURI, ALGERIA EARTHQUAKE

محل انتشار:

پنجمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1386)

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خلاصه مقاله:

In this study, the properties of the aftershock sequence in the first month after the 21 May 2003, Zemmouri earthquake are analysed. For this purpose, b-value of the frequency-magnitude distribution of earthquakes and temporal decay rate of aftershocks, as described by the p-value in the modified Omori law, are computed. The data reported by the CRAAG consist of 2152 events, covering the time period from 21 May 2003 to 30 July 2003, with magnitude range between 0.9 to 6.9. The obtained b-value using maximum likelihood approach is 1.10 ± 0.04 , with a completeness magnitude M_c equal to 3.5, and 1.30 ± 0.06 , with $M_c = 3.7$. Using the least square procedure b-value is 0.83 ± 0.08 . Both methods give typical b-values close to 1 for aftershock sequences. The obtained p-value of the Modified Omori law is 0.93 ± 0.04 , with characteristic time equal to 0.237 days. The modified Bath's law shows that observed magnitude difference between the main shock and maximum aftershock magnitude, noted m^* , is equal to 1.1, while using maximum aftershock magnitude inferred from the Gutenberg-Richter relationship by putting $N(=m) = 1$, it is about 0.8. Expressing the fraction of the total energy associated with the aftershocks in terms of b-value and m^* , we deduce that about 3% of the energy is dissipated through the observed aftershock sequence; nevertheless, 8% is obtained using the maximum aftershock magnitude inferred from the Gutenberg-Richter relationship. From the correlation integral, the fractal dimension of aftershock epicenters is estimated to be 1.79 ± 0.02 which allow us to deduce a cluster around the source zone. The Aki's dimension deduce that the slip ratio on the primary rupture fault segment over the total slip in the Zemmouri fault system is in the range 52-60%.

کلمات کلیدی:

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