



Short-time analysis of the ULF geomagnetic anomalies of the possible seismogenic origin observed at Teoloyucan station, Mexico, in 1999-2001

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The analyzed geomagnetic data were recorded at the Teoloyucan station (Central Mexico, geographic coordinates: $99\ 11'\ 35.735''\ W$, $19\ 44'\ 45.100''\ N$, 2280 m height). This station was equipped with a 3-component fluxgate magnetometer designed at UCLA, operating at 1 Hz sampling rate frequency, with a GPS system for data synchronization.

We studied the 7 strongest ($M_s > 5$) earthquakes with the highest seismic indices $k_s = 10^{0.75} \Phi_a M_s / 10D$ (Molchanov et.al. 2003), where $\Phi_a \approx (1 + D/10^{M/2})^{-2.66}$ is an attenuation factor, M_s is the magnitude of the earthquake, D [km] is the distance from its epicenter to the station and occurred under quiet geomagnetic conditions.

Recently, we performed long-time analysis of the continuous part of the geomagnetic spectra by 2 methods: a study of the spectral values $S_{H,D,Z}$ and their ratio S_Z/S_H as a part of the traditional analysis, and a study of the spectral ratio β for the fractal analysis (Kotsarenko et.al., 2004). In the line spectrum structure, we proved the existence of local geomagnetic pulsations possibly generated by a crustal source, and the noticeable long-time changes in recently discovered ULF resonant structure before the EQs (Kotsarenko et.al, 2005). In the present report we complete our study with a detailed short-time analysis of the mentioned seismic events providing as the reference (non-perturbed) signals recorded in the different geomagnetic observatories.

References

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