

New Results from Geodetic monitoring of the Kroupnik-Kresna seismotectonic area (South-West Bulgaria)

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For evaluation and studying the recent crustal movements and the physical events responsible for the strong earthquakes in Southwest Bulgaria, a geodetic monitoring of the Kroupnik - Kresna area was initiated in 1970 by the Central Laboratory of Geodesy. The last spring levelling measurements have been carried out in

April - May 2000 over 81 km of the 1st class state levelling line crossing the main Kroupnik fault. Other 14 auxiliary benchmarks established in 1986 between Simitli town and Pirin railway station have been also remeasured. The results from the analysis of this high precision levelling (precision of ± 0.8 mm in height dif-

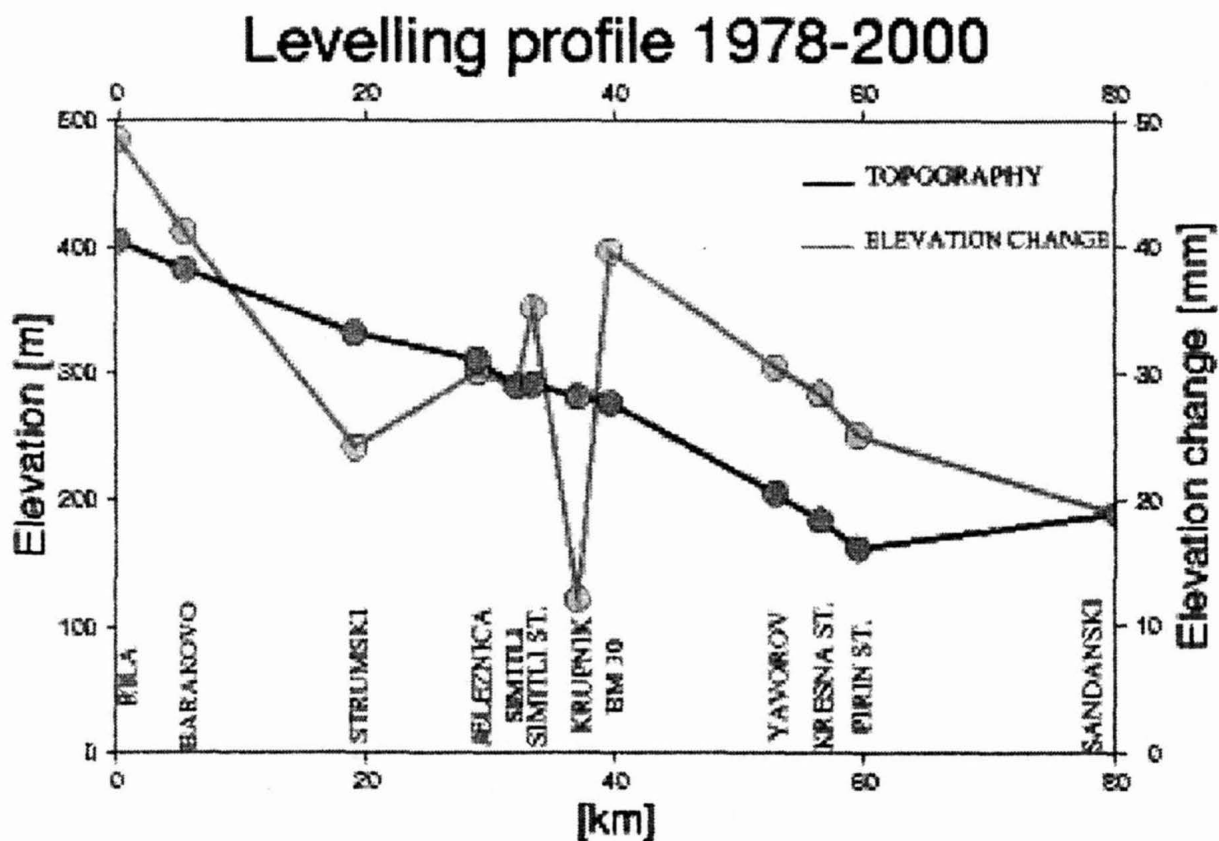


Fig. 1. Results of repeated levelling, 1978-2000

Levelling profile 1986-2000

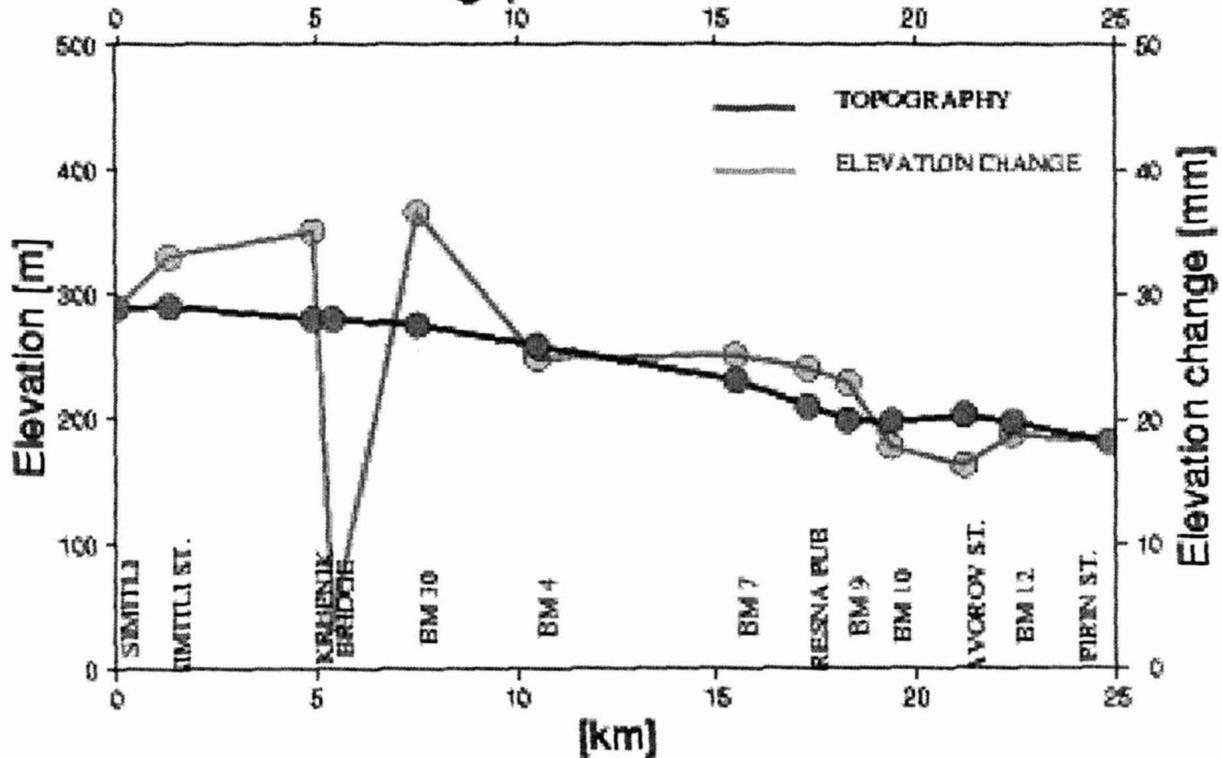


Fig. 2. Results from repeated levelling, 1986-2000

ference and ± 1.0 mm/km in distance) and their comparison with previous levellings, made in 1978 and 1986 respectively, show:

- subsidence with a maximum rate of -1.7 mm/y of the benchmarks at the Kroupnik railway station and on the bridge to the village of Kroupnik (in the area north of the main Kroupnik fault and south of the town of Simitli);
- uplift with a maximum rate of 0.6 mm/y at the southern side of the main Kroupnik fault;
- two benchmarks located in the area North of the main Kroupnik fault in the town of Simitli do not show detectable displacements since 1978 with respect to two 1st class benchmarks situated at 34 km north of Simitli and 47 km south of Simitli (in the town of Sandanski);
- the eight benchmarks located in the Kresna Gorge remain stable showing no recent activity along the Strouma fault zone;

- the observed uplift to the north of the North Pirin station and the subsidence of the benchmarks in the Pirin railway station (3 km to the south) are associated with the recent activity of a fault passing north of the North Pirin station, the so called Gradesnica fault (Zagorcev, 1992).

The results from the geodetic monitoring show a significant vertical crustal movements in the neighbourhood of the main Kroupnik normal fault confirming its recent tectonic activity. They are in agreement with the observed seismic activity in the region.

References

- Zagorcev, I. S. (1992). Neotectonic development of the Struma (Kraistid) Lineament, southwest Bulgaria and northern Greece. *Geol. Mag.* 129 (2), pp. 197-222.