



Multimethod geophysical surveying of active tectonic setting of Balatonfő line, Hungary: a case study

G. Molnár (1), B. Székely(1), P. Dövényi(2), F. Horváth(2), E. Ferencz(2), T. Lipovics(2)

(1) Space Research Group, Eötvös University, Budapest, Hungary, (2) Dept. of Geophysics, Eötvös University, Budapest, Hungary. (molnar@sas.elte.hu)

The study area, the Balatonfő region, is the hilly area east of Lake Balaton, Hungary. The Balatonfő line is a WSW-ENE directional structure line in the Paleozoic basement of Pannonian Basin. The age and detailed geometry of the fault is poorly known. Previous studies demonstrated that the western part of the line crosses the Lake Balaton. Therefore we have carried out high-resolution single channel water seismic measurements in the lake.

The results showed a flower structure involving the youngest (Holocene) strata in the lake. Consequently, the fault is considered as neotectonically active and should be traced further on shore.

To this end field geophysical measurements crossing the eastern part of the line have been carried out to detect the geometry in the Balatonfő region. Here, the Paleozoic basement rocks, including phyllites and conglomerates, crop out at places, but the area is mainly covered by late Miocene (Pannonian) lacustrine and subsequently Pleistocene fluvial and loessial sediments up to some hundred meters thickness.

Surface geophysical measurements were made to validate the structures shown on the geological map and their effect on young sediments. Field magnetic survey resulted a detailed magnetic anomaly map of the study area. The anomalies of the map seems to be similar to the anomaly caused by the phyllite outcrop of Balatonfőkajár. Model calculations resulted buried phyllite bodies south of the presumed Balatonfő line. Multi-electrode geoelectric survey measurements were made to find out the bottom of Pannonian strata. The results could be correlated with borehole data.

Furthermore, land seismic lines were shot to detect the flower structure on land as well. The pattern somewhat differs from that of the water seismics, only a few branches can be distinguished and, of course, the youngest strata is not imaged by the survey.

This research project was financed by Hungarian National Scientific Fund (OTKA) TS44765 and T047104.