



Monitoring of low-energy seismic activity in Elbrus volcanic area with the use of underground seismic array

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Results of experiment with underground seismic array for studying low-energy seismic activity in the Elbrus volcanic area are presented. Linear seismic array of 2.5 km aperture is created in the tunnel of Baksan neutrino observatory. Horizontal tunnel of 4.3 km length is drilled in the mount Andyrchi at a distance of 20 km from Elbrus volcano. Array includes 6 three-component seismic sensors with 24-byte recorders installed with 500 m interval one from another along the tunnel. Underground seismic array is the new instrument of geophysical observatory organized for studies of geophysical processes in the Elbrus volcanic area. The observatory equipped with modern geophysical instruments including broadband tri-axial seismometers, quartz tilt-meters, magnetic variometers, geo-acoustic sensors, hi-precision distributed thermal sensors and gravimeters. The initial analysis of seismic signals recorded by seismic array allows us to detect low-energy seismic activity in the Elbrus volcanic area beginning from the distance of 3-5 km (the faults in a vicinity of mount Andyrchi) up to 15-25 km (area of Elbrus volcano). The regional micro-earthquakes with magnitude 1-2 at the distances 50-100 km was also recorded. 2.5 km aperture of the underground linear seismic array make it possible to determine with high accuracy hypocenters of local seismic events associated with geodynamic of volcanic magmatic structures and to realize seismo-emission tomography of the active zones of Elbrus volcano.