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Fluid-magmatic systems of Central and North-Western Caucasus: geodynamics, seismicity and fluid activity

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Study of flows of matter and energy in geospheres has become one of the most significant advances in Earth sciences. It is carried out by means of direct quantitative estimations based on detailed analysis of geological and geophysical observations and experimental data.

The actual contribution presents results of processing of experimental data geological, geophysical and helium measurements carried out in the Central and North-Western Caucasus including the Elbrus volcanic center region and the Taman Peninsula (Taman mud volcanic province).

On the basis of collected experimental data there has been created the map of fluid permeability of the Earth's crust for the mentioned territory. This map has revealed deep ring structures and active trans-regional faults.

At the same time results of quantitative studies of mud volcanic activities in the Taman Peninsula (Norht-Western Caucasus) including measurements of concentration of mantle gases and determination of underground reservoirs using microseismic monitoring techniques are presented.

Last decade's increase of fluid and mud volcanic activities in seismic-prone regions of Central and North-Western Caucasus may indicate overall seismic activation in the area. Thus, monitoring geofluids over larger spatial scales is vital in understanding seismic risk in the environmental and economical hazard assessments.