

In course of the regular meeting of Academic council of Research Station RAS in Bishkek, which took place on December 17, 2015, the main results of research executed on 4 subjects were discussed:

Subject 70.1 - "Study of deep structure of Tien Shan and surrounding territories using a complex of geophysical methods to find out the interrelation of mass-energy transfer in the Earth's crust and upper mantle with spatio-temporal distribution of seismicity" was presented by Bataleva E.A. (Research Supervisor – Dr. Rybin A.K)

Subject 70.2 - "Study of distribution of velocities of the Earth's crust modern movements on the basis of measurements of a GPS network of Central Asia by means of space geodesy" was presented to Kuzikov S. I.

Subject 78.1 - "Study of geodynamic, seismic and geophysical processes as a base of earthquake forecast (including modeling of nonelastic processes in seismo generating zones)" it was presented by Bragin V.D. and Sychev V. N.

Subject 80.1 - "Development of hardware and software tools and basics of technology for electromagnetic monitoring of geodynamic processes in seismoactive zones and risk assessment" was presented by Ilichov P. V.

During the discussion followed there was offered to present to Department of Earth's Sciences of RAS 3 most important research results obtained in 2015 while execution of main directions of fundamental research. First result was voted as a best one.

The small-size, thermostable induction sensor intended for measurement of magnetic induction, high sensitive in the range of frequencies from 0,1 Hz to 80 kHz (figure 1), was developed. The technical result of development is confined in substantial increase of integration constant at preservation of high temperature stability of sensor transformation ratio. The model sample of sensor was designed. The developed sensor can be used in any geoelectrical exploration equipment based on measurement of artificial and natural electromagnetic fields.

By means of correlation analysis of time-and-frequency ranks of electromagnetic parameters there were revealed that the indicative strain-sensitive elements of geo-environment which corresponds to zones with dynamic influence of the Northern Tien Shan active faults. The strain-sensitivity of rocks massifs is estimated by correlation level between gravitational tidal impacts and electromagnetic parameters variations. Orientation of steady correlation clusters on correlation polar plots corresponds to fault strikes (figure 2) what testifies to the strain-sensitive nature of zones of the Northern Tien Shan active faults dynamic influence.

At common conformity in distribution of total horizontal deformation rates on GPS and KNET seismological data in the territory of the Central Tien Shan, the block of Earth's crust with raised and potentially dangerous gradients of deformation rate was pointed out. For considerable part of the territory studied the high degree of positive correlation of total horizontal deformation rates distribution for near-surface part of Earth's crust (depth to 5 km, space geological data) and a seismic active layer of the Earth's crust (depth of 5-20 km, seismological data) for the period of 1998-2014 was revealed. The central region of the studied territory is an exception (the Dzhungal-Too) where the decreased values of rate of a near-surface dilatancy and increased deformation rates in seismoactive layer of crust are fixed. The revealed discordance in distribution of near-surface and deep deformation indicates the energy-saturated and potentially dangerous volume of crust, from the point of view of seismic events manifestation and activity of explosive violations.