**Federal State Budgetary Institution of Science**

**Research Station of the Russian Academy of Sciences in Bishkek (RS RAS)**

**Major Results of 2017**

**Result №1**

The new breadboard model of electrical survey equipment with noise-like signals (ЭРК ШПС) notable for advanced technical features and parameters was developed and constructed (fig.1). Laboratory measurements of signal-noise ratio As/An for two breadboard ЭРК ШПС models showed that the signal-noise ratio measured for the new ЭРК ШПС model increased by 22 dB (12.6 times) in comparison with the model constructed earlier.

The ЭРК ШПС measuring complex is meant to be used in electromagnetic monitoring of stressed and deformed state of the Earth’s crust at measuring Bishkek Geodynamic Proving Ground (BGPG) sites.

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| Figure 1 – External view of measuring channel of a new ЭРК ШПС breadboard model:  1 – induction signal transmitter; 2 – power supply of the induction signal transmitter; 3 – calibration signal shaper; 4 - signal filtering unit; 5 – unit of signal control and record ; 6 – power supply of the unit of signal control and record |

***Authors:***

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***Publications:***

1. Ильичев П.В. Оптимизация технических параметров и характеристик геоэлектроразведочного измерительного комплекса с шумоподобными сигналами // Проблемы геодинамики и геоэкологии внутриконтинентальных орогенов: Тезисы докладов VII Международного симпозиума, г. Бишкек, 19-24 июня 2017 г. – Бишкек: НС РАН, 2017. – с. 409-412.
2. Лашин О.А. Разработка блока управления и регистрации сигналов для геоэлектроразведочного измерительного комплекса с шумоподобными сигналами // Современные техника и технологии в научных исследованиях: Сборник материалов IX Международной конференции молодых ученых и студентов.– Бишкек: НС РАН, 2017. с. 84-92.

**Result №2**

**Space-time relationship between local seismicity and variations of deformation state of the Earth’s crust was registered at the territory of Bishkek Geodynamic Proving Ground (Northern Tien Shan).**

Results of linear-angular and GPS observations in comparison with seismicity and source mechanisms made possible to estimate geodynamic environment during local earthquake of 10 energy class. Several days before the earthquake, GPS data showed the lowering of the Earth’s surface with amplitude up to 20 mm in this area. 5 days before and 2 days after the event, optical range measurements showed the increasing of lengths of lines crossing the Shamsi Fault on average by 8 mm within ~2 km from the earthquake source. Such increasing of fault width corresponds to variations of tectonic stresses ~7MPa near the fault.

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| Figure. Layout of researched area showing the location of grounds (sites and their numbers) of linear-angular observations POLIGON, KENTOR and ALMALY (1), GPS sites IATA, IAT3, POL2, CHUM (2), transient electromagnetics stations (3) and seismic focus (4) - focal mechanism. Lines – active faults. |

***Authors:***

Sergey Kuzikov, Vitaly Bragin, Nelya Sycheva

***Publications:***

Соболев Г.А., Кузиков С.И., Брагин В.Д., Сычева Н.А. Изменение деформаций на территории геодинамического полигона на Тянь-Шане и местное землетрясение 12.02.2013 г. // Геофизические исследования. 2017. Т.18. №3. С.45-59.