

**NATIONAL HELIOGEOPHYSICAL COMPLEX OF RAS:
RADIOPHYSICAL COMPLEX FOR IONOSPHERIC
AND ATMOSPHERIC RESEARCH**

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In the National Heliogeophysical Complex of the Russian Academy of Sciences, the Radiophysical Complex (RPhC) is the largest complex and multifunctional information system designed to solve problems of ionospheric and atmospheric physics, controlled modification of the ionosphere by powerful radio waves, and study of the effect of Near-Earth space (NES) physical processes on technological systems.

Structurally, RPhC consists of the main instrument cluster, which includes the most powerful and promising research instruments: a radio wave incoherent scatter (IS) radar for ionospheric sounding, a mesospheric-stratospheric-tropospheric (MST) radar for sounding the neutral atmosphere [Medvedev et al., 2020], and a heating facility for modifying the ionosphere by powerful HF radio waves [Vasilyev et al., 2020]. RPhC also comprises a network of coherent ionospheric radars (SECIRA) [Bergardt et al., 2020].

This cluster of large research measurement facilities will be supplemented with a system of small problem-oriented instruments and a meridional chain of stations Norilsk-Irkutsk (ionosondes, magnetometers, photometers, etc.).

RPhC is a multipurpose complex that allows fast transition to new challenges. Research directions will change due to the development of research into the upper atmosphere and solar-terrestrial relations. There are no facilities of this type in Russia nowadays, therefore a wide range of scientific questions related to the atmosphere dynamics is not supported by up-to-date high-precision experimental data. The modern IS-MST radar in Irkutsk will compensate for the lack of experimental data in this field of research.

The location of RPhC is unique since the complex will provide important geophysical data and monitor NES in the center of Russia, significantly complementing observational data acquired by geophysical centers in the USA, Europe, and Japan in studying global distributions of environmental parameters.

REFERENCES

1. Bergardt O.I., Kurkin V.I., Kushnarev D.S. et al. ISTP SB RAS decameter radars. *Solar-Terr. Phys.* 2020. V. 6, N 2. P. 63–73.
2. Medvedev A.V., Potekhin A.P., Setov A.G. et al. All-atmosphere IS-MST Radar. *Solar-Terr. Phys.* 2020. V. 6, N 2. P. 41–48.
3. Vasilyev R.V., Setov A.G., Frolov V.L. et al. Modern heating facility for research into the mid-latitude ionosphere. *Solar-Terr. Phys.* 2020. V. 6, N 2. P. 49–62.