



Geospace research at the Ukrainian Antarctic Station Akademik Vernadsky (review)

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The Ukrainian Antarctic Station (UAS) Akademik Vernadsky (former base-F/Faraday station, UK) has a long history of geospace research. First regular meteorological observation has been started here in 1947 and continuous until now. Within 50th-70th years of the previous century measurements of earth magnetic field at the magnetic observatory AIA, vertical sounding of the ionosphere, monitoring of the ozone content and observations of signals and noise within the VLF waveband have been performed at the station. Thus, the geophysical data arrays obtained at Faraday/Vernadsky are one of the longest in Antarctica.

Since 1996 when the station was transferred to Ukraine, the State Institution National Antarctic Scientific Center (NASC) coordinates activity of the scientific institutions occur in the framework of the State Special-Purpose Research Programs in Antarctica. The leading institution in geospace and space weather research is the Institute of Radio Astronomy (IRA) NAS of Ukraine. The Ukrainian scientists continue the majority of observations initiated by British Antarctic Survey and implemented a set of new research facilities and types of measurements. At the moment the instrumental park of the station includes: magnetic observatory that continuously records three component of geomagnetic field; Dobson spectrophotometer for measurements of ozone content; two ionosondes (old IPS-42 and new portable digital sounder produced in Ukraine); automatic multi-channel HF receiver to study long-distance propagation; ELF and VLF wavebands magnetometers for studying of global lightning activity, power line harmonic radiation and the state of lower ionosphere; two frequency GNSS receiver capable to estimate total electron content. The paper discusses in details the current set of research facilities and types of measurements.

During a little bit more than 25 year of Ukrainian geospace research at UAS the most significant results were: development of a mechanism for the transfer of atmospheric perturbations to the ionospheric heights; development of the concept of global electromagnetic resonators as indicators of space weather; development and implementation of methods of polarization multi-position location of powerful lightning discharges; monitoring and studying of long-distance HF propagation; providing experiments on artificial power feeding of ionospheric waveguide; discovery and study of the effect of "self-scattering"; monitoring the spread of man-made radiation to Antarctica, studying of "electromagnetic climate" and "electromagnetic smog".

During last several years the bandwidth and reliability of the Internet connection with Vernadsky were significantly improved. This made it possible to implement the real-time transfer of data from Antarctica to the Ukrainian server. Now we are working on development of web-accessible database of geospace data from Vernadsky and results of their processing. In the paper we present and discuss a prototype of this software that in the future may be upgraded to National Antarctic Space Weather operational service.