

## **GAMMA-RAY SPECTROMETERS ON LAUNCHED AND PLANNED MSU CUBESATS FOR SOLAR-TERRESTRIAL RESEARCH**

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Gamma-ray scintillation spectrometers DeCoR (Detectors of Cosmic Radiation) developed in SINP MSU are installed on a number of small satellites of the cubesat format, launched in June 2023 into a circular polar orbit with a height of ~550 km. They are designed to study hard x-ray and gamma radiation from solar flares as well as fast variations in near-Earth electron fluxes and astrophysical gamma-ray bursts. The detectors of the most of the devices are a combination of a plastic scintillator ~3 mm thick and a CsI (Tl) crystal ~10 mm thick allowing to distinguish between solar flares and electron precipitation. Some satellites additionally have gamma-ray spectrometers based on a large CsI(Tl) crystal in order to register gamma-ray quanta of MeV energies. The output data are generated both in the form of monitoring and in an event-by-event format. The data is stored in the non-volatile memory of the payload. Thus, during the space experiment, it is possible to select the most important data sections for transmission to Earth in primary form, which allows for studies of the rapid variability of the measured radiation fluxes.

At the present moment, the methodology of a space experiment using DeCoR equipment has been worked out during flight tests. A hard radiation from a number of solar flares was recorded and solar cosmic rays were also observed. It is planned to continue the experiment on the satellites mentioned above in the next 1-2 years, as well as to launch several new nanosatellites with improved equipment. In particular a new 16U cubesat Scorpion will have pixelated gamma-ray spectrometer consisting of 4 detector units each containing 64 individual scintillating elements with size 10x10x20 mm. The launch of this satellite is scheduled for late 2024 – early 2025.