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MONITORING THE EARTH'S ENERGY BUDGET AND CLIMATE FROM THE SURFACE OF THE MOON

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We have developing very important special space project "Lunar optical observatory" (LOO) (http://www.gaoran.ru/russian/project/lunar_observatory. pdf) on monitoring of the Earth's energy budget and climate. LOO is necessary for the long-term investigation of the deviation an average annual energy budget of the planet from the equilibrium state and of physical reasons of the climate changes. LOO is a system of two completely identical special optical telescopes-robots with diameter of the primary mirror ~300 mm with visor (SOTR-300V) operating successively in the automatic mode on a single program of Earth observation as a single telescope. Telescopes SOTR-300V installs along narrow latitude of the equatorial zone of the visible surface of the Moon on two opposite edges relative to its visible center at points at a distance 9.1°±0.1° respectively from the eastern and western edges. Comprehensive measurements variations of reflected and scattered by the Earth of the total solar irradiation (TSI) in all directions in the wavelength range $\Delta\lambda$ = 0.2 – 4 μm, the thermal radiation of the Earth in the wavelength ranges $\Delta\lambda$ = 4 – 50 μm and the atmospheric transparency windows $\Delta\lambda$ = 8 – 13 μm, as well as of the remote sensing of the Earth from surface of the Moon (RSM) in 10 narrow predetermined ranges of the spectrum ($\Delta\lambda$ = 0.3 – 3 μm) are carried out consecutively by two SOTR-300V in during more 94% lunar day continuously only at night in places of their installation. The system two telescopes SOTR-300V provides the most reliable high-precision data of global climate parameters, as well as monitoring of the surface state, clouds, vegetation, cryosphere, concentration aerosols and ozone around the globe with a spatial resolution of 6.5 km. SOTR-300V will used a microbolometric CCD for a comprehensive measurement of the reflected and scattered by the Earth of the TSI in all directions in the wavelength range $\Delta\lambda$ = 0.2 - 4 μm and the thermal radiation of the Earth in the wavelength ranges $\Delta\lambda$ = 4 - 50 μm and $\Delta\lambda$ = 8 – 13 μm. The average annual values of the Bond albedo and the Earth's own thermal radiation determined by the Lunar Optical Observatory, and on their basis the deviations of the average annual energy budget of the planet from the equilibrium state will be practically an order of magnitude more accurate than those determined by any orbital spacecraft. LOO for the first time during a significantly superior 11-year cycle of the Sun will provide the most important missing precision global climate data that cannot be obtained by any other cosmic methods of their direct measurements.