

Lunar Exploration (2)
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FROM LUNA-25 TO LUNA-29: ROBOTIC MISSIONS AS PRECURSORS OF HUMANS ON LUNAR
SOUTH POLE

Abstract

The most interesting sites for future lunar outposts are thought to be close to poles, and South pole is found to be more preferable than the North one. But before humans could land there, the sequence of robotic missions should be implemented to study the natural environment at the selected sites, to deliver some supporting systems for ensuring conditions of habitability and also to test the innovated technology for Earth-Moon-Earth round trip. The Russian Lunar Program will be ignited by the number of five robotic mission, as it's the very first stages, which should accomplish these goals. The talk will describe the scientific and engineering goals of these missions, Luna-25 – Luna-29, which Russian Academy of Science has determined for the decade of 2020 – 2030. In particular, the objectives of these missions will be discussed in details, which are critically important for accomplishment of the first polar expedition of humans. They include the orbital mapping of polar regions with fine spatial resolution, the measurements of radiation environment at the selected candidates for landing sites, the presence of water and space volatiles in the polar regolith, in particular – the presence of complex molecules and pre-biotic Molecular complexes, the lunar dust and exosphere, etc. Mobile elements of landing missions will investigate the local areas around the landing sites to determine the best spots for the future habitation elements of human missions. In addition, the researches for the basic science will also be accomplished by these missions, such as the experiments for lunar-based astronomy at long wavelengths and at gamma-rays, the experiments for lunar seismology, lunar monitoring of interplanetary plasma and solar wind, etc. The opportunities of international cooperation will be discussed. The already established cooperation with ESA will be described, and plans for increasing of the international involvement will also be presented.