



Perspectives of Russian robotic lunar program

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After historical achievements of 60-ies and 70-ies (Lunar regolith sample return , 2 Lunokhods) Russia is resuming its interest to the investigation of the Moon, studies of its surface, inner structure and exosphere.

Both Landers are designed for polar landing. Lunar Lander of “Luna-Resource” will deliver Indian mini-rover on the lunar surface. Lunar Lander of “Luna-Glob” will have boring system onboard. Both Landers have identical Manipulators for delivering samples to on-board analytic instruments.

Short-term (<2015) Russian Lunar programme consists of 2 missions – Luna Glob and Luna – Resource (the second one jointly with ISRO of India). Both missions have similar landers to study Northern and Southern Polar regions of the Moon and to explore in situ previous findings of “wet polar domains” with significant fractions of subsurface water ice and other volatiles. NASA’s LCROSS and LRO mission with LEND, LROC and Diviner instruments revealed that these cold and volatiles-rich domains are not necessarily coincide with the permanently shadowed regions near lunar poles, and this finding has drastically simplified their in situ investigation. Both landers will have almost similar payload (Luna-Glob lander will have the additional capability for 50—90 cm deep drilling). In addition to instruments for studies of lunar dust, regolith and frozen volatiles, both landers will carry seismometers which will work in concert with other instruments of International Lunar Network system. Luna Glob orbiter will provide measurements of solar wind and sputtered particles in the Lunar exosphere, peculiarities of its magnetic field and corresponding wave-particle interactions.

Mid-term Russian Lunar programme (after 2015, see Figure) is aimed at further analysis of volatiles in polar regions, mobile selection and pre-delivery screening of samples of polar regolith for a future “cryogenic” return of selected samples to the Earth (“cryogenic” means special cold conditions of sample processing to keep all volatiles frozen).

Long-term Lunar programme, which is under discussion now, shall be based on parallel manned and robotic missions for investigations of the unique regions near lunar poles for further exploration.