Overview of Lunar-A Mission

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The science objective of the Lunar-A mission is to obtain new information of the internal structure of the Moon using two penetrators deployed on the near-side and the far-side of the lunar surface. It is scheduled to be launched in summer, 2003 and after a half year cruise to the Moon, the spacecraft is inserted to the lunar orbit and the two penetrators are deployed on the lunar surface within a month after LOI. The seismometers with horizontal and vertical components and heat flow measurement device are on board the penetrator. These instrument will provide important data on the lunar internal structure, in particular, the size of the core, and on the thermal state as well as the bulk abundance of the heat-generating elements in the moon.

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The data gathered by the seismometers and heat flow probes within the penetrators are numerically compressed and stored in a recorder within the penetrator and then will be transmitted to the Earth via the carrier spacecraft which comes over the penetrator every about 15 days. A VHF (f =400 MHz) telemetry system is to be used for the communication link between the deployed penetrators and the mother spacecraft, while communication between the spacecraft and ground station, UDSC (Usuda Deep Space Center) is assured by S-band (2 GHz).

We expect that two penetrators containing ultra-sensitive seismometers and heat-flow probes deployed on the lunar surface will provide us with many new data on the lunar internal structure and thermal state. The imaging camera on board the orbiter spacecraft will also enhance our understanding of the early history of the lunar crustal evolution through the images taken at much better spatial resolution than that of most Apollo orbiter images. These new information obtained by LUNAR-A mission will give much stronger geophysical constraints on the origin and evolution of the moon than ever available