Mission Support Role of a Lunar Rover

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As an extension to space robotics technology, National Space Development Agency of Japan (NASDA) has been examining possible scenarios for unmanned planetary explorations. The Japanese lunar-observation-satellite mission, SELENE, is scheduled for the year 2004, scientists and engineers here have begun their considerations to the next generation lunar-surface exploration. While efficient and scientifically significant mission concepts are being drafted among the planetary scientists, system engineers are working closely to put together a multi-mission of science as well as technology evaluations. Under limited resources allocated for such payloads as mission instruments, rover robotics would lead to diversity in mission concepts.

The paper discusses the roles of planetary rovers in terms of "mission support" aspects during presumed lunar-surface robotics tasks, and then describes a Compact Payload-Interface-Device (CPID) which acts as a common gateway for detachable instruments. A surface excavation tool is also designed and evaluated for its "mechanics-soil interaction" characteristics as one example of system designing approaches.