

HUMAN EXPLORATION OF THE SOLAR SYSTEM SYMPOSIUM (A5)
Human Lunar Exploration (1)

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GEOLOGIC RECONNAISSANCE OF LUNAR SURFACE AND ANALYSIS OF LUNAR
SETTLEMENT AREAS AS PER GEOLOGICAL CONSIDERATIONS

Abstract

Various geologic reconnaissance methods with the aim of selecting sites for lunar human habitat or emplacement of electromagnetic sensors are considered. The hazard of cosmic radiation on the surface will limit such activities to subsurface features such as lava tubes which can be mapped out using a low frequency ground penetrating radar unit on a low orbit around the moon. Initial investigations have already revealed dimensions and topography of roof-top collapsed lunar lava tubes as being conducive to experimentation and colonization related activities. Initial delineation of such areas through satellites will allow further detailed investigation through robots on the surface through GPR profiling and sounding. The difference in mineralogy and thus dielectric constants between lunar regolith and basalts is the reason for advocacy of GPR technique. The similarities in origin and geology of the Earth and the Moon means the disposition of lava tubes on the former will resemble in subsurface architecture with the latter which is done through a comparative study of such volcanic feature on the earth and photogeologic investigations of the surface of the moon. Furthermore the paucity of erosion and weathering agents on the lunar surface will preserve the structural integrity of the lava tubes thereby rendering them suitable for our objectives.