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Perspective

Usage of Hyperspectral Data for Crater Detections

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DESCRIPTION

The Moon is the Earth's most significant natural satellite and nearby object. It has no atmosphere. The gravitational force on the Moon is just 1/6th of Earth's and is unable to sustain its atmosphere. Due to the absence of a strong molten iron core like Earth, the magnetic field is not present on the Moon surface. The Moon has become the main research area for getting the information of origin and evolution of the Earth-Moon System and the Solar System, since of its exceptional location and potential abundant resources, lunar morphology studies have long been a primary aspect of lunar exploration since the morphological characteristics of the lunar surface do not only straightforwardly reflect the Moon's current state but also record details that reveal the formation and evolution history of the Moon.

The origin and evolution of the Moon are hypothesized into four basic scientific concepts. A complete outline of those theories or hypotheses is specified. Fission hypothesis suggested that because of the tidal forces, Moon evolved from the early Earth by splitting it into two. According to the co-accretion hypothesis, the Moon has classified Earth as a companion in the same solar system neighborhood. The theory of co-accretion does not clarify the orbital relationship between Earth and Moon and their varying densities. This new planetesimal impact hypothesis could resolve problems related to any of the classical individual hypotheses such as early lunar dynamics, structure, primary thermal state and formation timing of Moon. These theories would be helpful in understanding the formation of Moon materials.

The Moon's surface is generally dry, dusty and rocky. The rocky crust is about 60 km thick on the near side that faces the Earth and about 107 km on the far side as Moon' terrain is divided into two sharply contrasting areas. The rugged and very ancient mountainous highlands regions and other is smooth younger lowland Maria regions. Highland materials are rich in Plagioclase due, to its higher Plagioclase contents highland materials are shiner than the mare materials. Mare materials are darker than the highlands material because it is rich in mafic silicates and Ilmenite.

Lunar morphology studies have been a primary aspect of lunar exploration because the morphological features of the lunar surface not only present the Moon's current state but also store the information that reveals the history of Moon's formation and evolution. Amongst the different lunar morphological features, lunar impact craters are one of main geological section. Impact Craters are formed as a result of the collision of meteorites, comets and other celestial objects on the surface of the Moon. The morphological character of these craters such as shape and size depends on the impactor's density, diameter and direction at which impacting body (impactor) enters into the moon surface.

CONCLUSION

It has been obtained that lunar craters are mostly circular due to the explosion caused by the impact of excavated material in all directions on the lunar surface. The forming procedure can be divided mainly into different phases compression and excavation, morphological shift, continuous morphological change stage and the formation stage. The simple crater structure forms bowl-shaped depressions or cavity and is lesser than a few kilometers. A simple crater developed from the modified transient crater with some slight collide with steep upper walls into the crater. Again deposition of the expelled material in the crater causes an increase in diameter up to 20 km whereas the depth remains unaltered.

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