

Surface Processes

1.0 Introduction

Discuss the surface of the Moon. Summarize the properties of the surface (i.e., the regolith), the processes that operate on its surface in the present environment (i.e., Copernican) and a discussion of how the current processes affect the evolution of those properties. Summarize outstanding questions.

2.0 Regolith

2.1 Properties

- Chemical, mineralogic, petrologic composition
- Particle size frequency distribution
- Grain size and shape
- Grain and bulk density
- Porosity
- Permeability and diffusivity
- Compressibility
- Shear strength
- Bearing capacity
- Slope stability
- Trafficability
- Thermal conductivity / diffusivity
- Electrical properties
- Radar properties

2.2 Stratigraphy

- Lateral and vertical variation
- Cross sections (e.g., Hadley rille vs. cores)

3.0 Surface processes

- Surface dust mobility
- Cratering (micro to macro)
 - Current cratering rate
 - Ejecta distribution (proximal and distal)
 - Effects on the surface (e.g., thermal anomalies)
- Mass wasting
- Physical disruption, thermal fatigue
- Volcanism (IMPs and pyroclastics)

4.0 Regolith Formation

- Formation dynamics (Shoemaker, Quaide, Oberbeck, Gault)
- Regolith thicknesses and variations with age; rates of turnover (gardening)
- Sources of fragments
 - vertical v. horizontal mixing/transfer

5.0 Regolith Evolution Maturation

Regolith turnover
Implications of current cratering rate
Space weathering
Solar wind
Cosmic rays

6.0 Volatiles

Volatile content of the regolith

7.0 Outstanding Questions

8.0 Summary

9.0 References