



# Soil Preparation for the Determination of Physical Properties in Planetary Surfaces

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## Abstract

Soil physical properties are key values for the understanding of planetary surfaces, which have relevance for atmospheric exchange processes, wind transport processes and account in the exploration of the planetary development.

Soil physical properties play a major role for the forward motion of drilling and hammering instruments in near-surfaces layers of planetary surfaces. On the one hand they influence the performance of these instruments during penetration on the other hand the performance of drilling or hammering instruments provide the possibility to retrieve information about the soil physical properties of surfaces.

At DLR mole penetration tests have been performed, with a hammering device for the investigation of planetary surfaces up to a depth of 5 m. The performance results of such tests shall be the input of simulation models for the determination of the soil physical properties.

For the validation of these kinds of simulations it is necessary to prepare characterised test soils. Challenging is in these cases especially the determination of depth profiles of soil properties and the preparation of reproducible soil conditions. Depending on the cohesion of the various soils different procedures of soil preparation are required. The preparation of reproducible test soils and the determination of soil physical properties will be in the focus of this presentation.

The preparation of our test soils will be described as well as our methods for the determination of soil properties. The whole presentation will be in the context of recent mole tests for its application on different planetary surfaces.