INPUT PARAMETERS IN THE CALCULATION OF LOAD DIFFUSION THROUGH LUNAR REGOLITH LAYER: PROBLEMS RELATED TO THEIR DETERMINATION

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The design of a lunar habitat must solve the problem of the protection from space radiation, extreme temperatures and mechanical stresses, such as those resulting from static and dynamic loads. A shielding regolith layer is an option. Its mechanical performance can be assessed by modelling the load diffusion through it, by either FEM or DEM simulation. Uncertainties of the numerical results are related to the implemented soil parameters, whose determination requires phenomenological understanding, at both the particle scale and the scale of the representative elementary volume. This issue is complicated by the microstructural features of the lunar regolith particles, i.e., their irregular shape and susceptibility to mechanical damage. Under this perspective, experimental problems related to the measurement of mechanical parameters of a lunar simulant, by both interparticle and element testing, are pointed out and discussed.