

Experimental study of the properties of the lunar soil simulator under shock compression

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Shock adiabat of soil that models the porous surfaces of the Moon in the range of impact velocities characteristic of micrometeorites have been experimentally obtained. These data are necessary to explain the observed optical phenomena on the surfaces of planets and to reliably simulate the landing conditions of the descent vehicles. The velocity profiles of the free surface of samples made of loose andesite grain size 80–90 microns, in the range of shock compression pressures from 0.4 to 2.0 GPa, were measured by VISAR laser interferometry. The characteristic velocity profiles and the modes in which they are measured are presented. In the coordinates mass velocity–shock velocity, the shock adiabat is represented. The data were compared with similar materials. It was found that its slope is close to the slope of the Hugoniot of quartz sand, but lies significantly lower. In order to identify the effect of certain chemical compounds in the composition of samples on adiabat, a study is necessary in which their composition will vary.