

## Lunar seismic waves fields after meteoroid impacts, 1972 y., May 13, July 17

O. B. Khavroshkin (1), V. V. Tsyplakov (1), and S. Tanaka (2)

(1) Institute of Physics of Earth Ras. Acad.Sci., Nonlinear seismology lab., Moscow, Russian Federation (khavrole@ifz.ru, +84952522198), (2) ISAS, Japan

### Abstract

The specified on the title 2 meteoric impacts are unique for a history of tool lunar seismology. Capacity of each of them is  $\sim 10^6$  kg TNT, the first falling on distance is  $\sim 150$  km from the nearest seismic station, 2-nd in a region of a Moscow crater on the Moon far side.

As a result of falling there were powerful seismic wave fields of unusual duration about 4-5 hours (value conditionally enough since depends on sensitivity of seismic stations). Records of these fields (seismogrammes) are the unique material information content of which in many respects is determined by the software and a level of physical understanding of community.

Besides it is a unique channel of information about an internal structure of the Moon because seismogrammes contain the latent own periodicity of the Lunar oscillations caused by meteoroid impacts. For allocation of these periodicity spectra seismogrammes were received. Further on the basis of spectral processing of records tables from significant ( $P > 0.95$ ) spectral peaks of environment bending around directly seismic response to falling of meteorites and also peaks of their codes in a range from 60 min up to 30 sec on all three components were made.

The number of peaks for each of events was distributed on components: 1 - st event - X - 120; Y - 100; Z - 68; 2 - nd - X - 82; Y - 73; Z - 74. As 1 - st was not far distance waves of superficial type have caused much more periodicity in comparison with P - waves (Z - a component). For 2 - nd - with a source almost in an antipode point - superficial waves were showed only as

components first of all own spheroid oscillations of the Moon. Insignificant excess of number of peaks on X - a component, probably, is connected to excitation torsion wave oscillations. Few other features are marked.