

Radio Emission of the Moon before and after the Lunar Prospector Impact

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The direct impact of the American spacecraft Lunar Prospector into the Moon in the south polar regions occurred in July 31, 1999. This collision was accompanied by seismic effects comparable to a big moonquake. Due to the peculiarities of the lunar lithosphere structure the duration of seismic effects on the Moon lasts some hours and such impact events may be accompanied by radioseismic radiation (RSR) of the lunar surface layers. Radioseismic radiation during an earthquake has been detected (Sobolev, Demin, 1980). The registration of the lunar RSR arising due to moonquakes or meteoroids impacts may be lead to the creation of a new information channel of investigations of the lunar seismisivity and the internal structure.

The kinetic energy of the Lunar Prospector impact into the Moon was about 1015 ergs. In this case the energy of the lunar RSR may be equal to 108 - 1010 ergs. Unfortunately the uncertainty in estimates of the radiation duration and the frequency dependence of emission power is high.

For the registration of lunar RSR after the Lunar Prospector impact the radio observations of the Moon on the two 64-m radio telescopes of the SDO MEI at Medvezh'i Oзера and Kaliazin were conducted during July 30 - August 2, 1999. Due to strong radio noise the quality of radio observations at Medvezh'i Oзера was not good. The radio observations of the lunar polar regions, seismically active and seismically passive regions were conducted on the Kaliazin radio telescope at 13 and 21 cm. The sensitivity of the radio receiver was 90 Jy in both radio wavelengths, the accuracy of the measurements of the lunar radio emission was 1-3 K. Changes of the radio emission of the south polar regions by comparison with other regions were detected. The Lunar Prospector impact may have been the cause of these changes.

Recommendations about the registration of the Lunar RSR during Leonid's activity in November 2000 are given.