Capabilities of the PmL device for plasma-dust sensing of various space objects

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Space experiments on contact detection of dust for various extraterrestrial objects were launched in the Apollo 17 mission and continue to this day. LEAM (Lunar Ejecta and Meteorite), PUMA (Particles dUst Mass Analyzer), GIADA (Grain Impact Analyzer and Dust Accumulator), SP-1/METEOR (dust counter), LDEX (Lunar Dust Experiment) and others are very interesting dust instruments aboard famous space missions. The PmL device was created to monitor plasma-dust dynamics near the lunar surface. In the Luna-25 mission, the device worked in a transfer orbit for more than an hour, obtaining not only calibration data, but also real measurements of the dust and plasma environment for two flyby zones. The ability of the PmL to measure the pulses and charges of dust particles is not limited by a deep vacuum, and the design capabilities make it possible to obtain scientific data from the PmL instrument on Mars, in terrestrial conditions and in outer space. The range of measurement of the momentum of dust particles, starting from the minimum - fractions of a picoNewton per second, extends to more than 6 orders of magnitude with the possibility of registering their charge from 1500 electron per dust particle. It is especially productive to use PmL on the surface of the Moon as a dusty-plasma device, since in addition to detecting dust particles flying near the lander, it can diagnose changes in electric fields in the landing area using the Langmuir probe.