Seismic measurements on the Earth and planets of the Solar system

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Abstract The article deals with the main problems of constructing a seismic accelerometer for measurements on the planets of the Solar system. Data on the main parameters and features of a seismometer for measurements on Mars (SEM instrument) are presented, including the use of elastic braces to obtain a uniaxial sensor of primary information and the introduction of magnetic rigidity for precise setting of a test mass under conditions of free fall acceleration on a selected planet. The issues of using the design of the SEM instrument for measurements on the Moon (SEISMO-LR instrument), as well as the possibility of installing the instrument on the descent vehicle due to the lack of an atmosphere on the Moon and, consequently, wind loads, the issues of possible damping and distortion of small surface oscillations by the descent vehicle are discussed. It is shown that instruments developed for planetary research could be used for measurements on Earth.

Keywords Seismometer, single-axis sensor, tilt, permanent magnet, thermal noise, magnetic rigidity, capacitance, stretch, free fall acceleration.

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