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Project "Europa lander-Sounding": Experimental possibilities for complex sounding of the subsurface-geoelictrical structure of Europa moon.

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Abstract

The primary goal of the "Europa lander" mission is an investigation of the Europe moon and particularly its internal structure. These studies are based on the following measurements which are performed by various instruments carried by the spacecraft:

- gravitational field variations caused by librations fluctuations of Europe moon and tidal effects;
- seismic noise at frequencies between 0.1 and 100 Hz for revealing how their intensity and spectral structure depends on thermoelastic effects, artificial and natural influences on the Europe moon surface (P- and S-waves from working GZU (manipulator for automated testing for soil and rock properties); dust and gas fluxes from the torus around the Europe moon orbit, impacts of small meteoroides et etc);
- magnetic (3 components) and electric (2 components) field fluctuations in the frequency range from 0.1 to 1000 Hz which allows to determine an impedance on a surface of the Europe moon (magnetotelluric sounding) and to investigate electrodynamic properties of rocks from which the Europe moon is made;

The available photometric data gathered earlier show rather complex character of both Europe moon surface and it's subsurface structure.
The complex sounding of the Europe moon provides not only the information about its structure (important for understanding of the origin of the Jupiter system) but also an outstanding experience of sounding at surface of celestial body. This experience is of particular importance for further investigation of subsurface structures of Europe and its geological history which will be carried out in the future space missions.

References

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