Exploration of Other Destinations (5)
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ABOUT REUSABLE AUTOMATIC TAKEOFF AND LANDING COMPLEXES FOR SCIENCE RESEARCHING IN DEEP SPACE

Abstract

The author considers various ways of researching planets and their satellites, systematizes them, reducing to three main methods: researching of planets from flight paths, researching of planets from the near-planet orbit, researching of planets with landing of probes directly on the surface of the planet. All three methods have their advantages and disadvantages relative to each other and are using in modern research of space objects. The author sets the task of finding such a technical solution (another research method), within the framework of which it would be possible to achieve the following results within one mission: global coverage of researching (including contact's researching) of the planet's surface in one mission of a spacecraft; conducting contact researching with minimal knowledge about the planet's soil on its surface (providing pioneering missions on the surface); receipt within the framework of one mission of contact information on a substance from several regions of the planet that are distant from each other at considerable distances (from tens to several thousand kilometers); moving the landing probe along several specified routes for several minutes with the support of photo (video) shooting of the surface; multiply using of probe (a technical tool is using several times). Since none of the previously used (listed) methods provides such results, author suggests using another researching method. This method involves the using of reusable take-off and landing complex (RTLC) and their refueling in orbit from an orbital refueling tanker (ORT). The method has broad prospects for implementation and, in fact, turns spacecraft (both RTLC and ORT) directly into scientific space tools. The author gives comparative assessments of the effectiveness of the proposed solution and a specific implementation option.