Analysis of the landing practice of the "Venus-9–14" and "Vega-1, -2" spacecrafts on the Venusian soil for the development of promising "Venus-D" spacecraft

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The article considers problems and prospects of landing future space vehicles on the ground of Venus in a new Venusian area, called "tessera" and having a complex terrain. The landing means the final stage of the spacecraft flight to the planet, i.e. the impact contact interaction of the spacecraft with the ground of the planet. The terrain in the areas of past landing of spacecrafts on Venus is compared with areas of possible landing sites in the future. A brief description of earlier tests of landing on grounds - analogues of Venusian ones is given and their application for perspective projects is analyzed. A mathematical model for studying the dynamics of the impact contact interaction of the landing gear with deformed Venusian soils is described. This model was used in the development of the "Venera-9–14" and "Vega-1, -2" landing vehicles. Based on the results of the analysis of their landing and the physical and mathematical simulation of the landing process, recommendations were developed for the implementation of the landing of the advanced Venera-D spacecraft in the regions of Venus with a complex terrain.

***Keywords**: grounding, the landing gear, drop tests, model of grounding*

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