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ARY STERNFELD AND MODERN COSMONAUTICS

Abstract

The Paper is devoted to one of the Cosmonautics Pioneers Ary Sternfeld whose 105th Birth Anniversary is marked in this year.

The first part of the Paper presents scientist's life and his work way (1905-1980). He devoted all his life to investigation of Cosmonautics' problems. An analysis of Sternfeld's significant contribution to Astronautics is performed. First of all, this is a scientific popularization of Astronautics' ideas for many years. In particular, probably, it was A. Sternfeld who firstly made the good acquaintance for Europe with K.E. Tsiolkovsky's pioneer works in Cosmonautics. Stermfeld's scientific achievements were important, too. In the first line, this is his discovery of bi-elliptic trajectories for a re-entry from an initial orbit to a central celestial body [1, 2] and for the transfers between the orbits [3]. Then, his monograph "Introduction to Cosmonautics" (1937) became Sternfeld's certain achievement in Cosmonautics. In particular, the author here introduced some important terms such as Cosmonautics, the first space velocity and the second one; these terms entered into the space lexicon for many people. For many space engineers and cosmonauts, this monograph was a textbook at initial time of the space researches. A review of this monograph is given in the Paper.

Connection of Sternfeld's works with modern Astronautics is analyzed in the second part. It is shown that his idea of bi-elliptic flight entered into the modern theory of space maneuvers. It is also shown that a join of his this idea with an idea of a gravity assist lies on the base of some new interesting solutions for several important space problems. E.g., these are: the flights between Earth and Geostationary Orbit using Lunar gravity assist; the "detour" flights between Earth and Moon in frame of the four-body (Earth, Moon, Sun, spacecraft) problem with a passive capture or escape; the "detour" flight from Earth to Sun out of ecliptic plane using the Jupiter gravity assist.

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References

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