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FLYBOARD AIR: SUSTAINABLE TRANSPORTATION ALTERNATIVE FOR EXPLORERS ON MARS

Abstract

The exploration of Mars and with it the imminent arrival of man to its surface, reveals a series of challenges, among which the search for a functional and efficient transportation system for astronauts stands out. In this sense, the Flyboard Air (FBA) emerges as a promising alternative due to its performance in land conditions. Our research aims to propose this new technology for implementation on Mars, due to its characteristics that can be easily adapted to the Martian atmosphere and gravity. For which, at first, a study of the current state of the FBA will be carried out with emphasis on its power, type of propulsion, fuel and material used for the prototype. Then, a redesign will be sought in order to adapt it to the conditions of the red planet by evaluating its power when operated under winds characterized by sudden changes in speed and direction and that carry particles of dust and sand, as well as its jet propulsion system in low atmospheric density. Finally, in relation to fuel, with an In Situ Resources Utilization (ISRU) approach, it will be proposed to use the resources available in the Martian environment, such as hydrogen obtained through the electrolysis of water present in the sub-crust of Mars and in polar caps, such as the main source of energy, adopting a sustainable perspective to optimize fuel consumption and avoid the need to transport it from Earth. In conclusion, it is expected to present a base framework of benefits and functionalities of the FBA, representing a considerable advance in the development of astronaut transportation systems on other planets.