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VAMI - AN EXPLORATION OF VALLES MARINERIS

Abstract

The era of Space Exploration is reaching greater heights with every passing day. The search for the signs of Extra-Terrestrial life in our Solar System still remains a mystery and various missions are being planned to get a step closer for the search of the answer. Mars is one such astronomical body in our solar system which is not only the possible inhabitable zone for the human civilization but also a place to look for the possible signs of life. The research paper focuses on a project to explore the vast canyon system on the Martian surface, Valles Marineris. This site on Mars provides the best exposure of the ancient geological history of Mars. VaMi, abbreviation for Valles Marineris is a mission proposed in this paper. VaMi aims to survey the Valles Marineris canyon system. Unlike the other missions which involves landers and rovers, this mission will aim to gain the data from this vast canyon system with the proposed small flying-bots. A cluster of flying-bots can be used to explore the depths of the valley and gather the information hidden deep within. The exploration of this valley region can open doors to many of the long-answered questions. To navigate, broadcast positional data and exchange science data during the operational phase, a lander has also been proposed. This lander will not only perform the above-mentioned functions but also be home to these flying bots. Analyzing the regions of the valley with respect to the terrain, wind and solar condition, Melas Chasma and Capri Chasma are the potential two landing sites for the lander. The lander and the bots will be solar powered; however, an alternate/backup power system has also been proposed in the paper for the lander. Each bot will be carrying different payloads than the other, the paper discusses all those payloads in details along with the ones on the lander. The overall mission plan, the objectives and the proposed structure of the flying bot and the lander has been laid out in the paper.