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THE STUDY ON THE LONGTERM ROADMAP AND INITIAL SIZING ON MARS DRONE(HELICOPTER) OF KOREAN MARS EXPLORATION

Abstract

In 30 July, 2020 NASA launched Ingenuity with Perseverance to Mars. In 18 February 2021, Ingenuity landed on Mars after about 6 months from the launching at earth. In 3 April 2021, Ingenuity deployed from the Rover Perseverance after 45 days from the landing on Mars. In 19 April 2021, Ingenuity made the first flight on Mars. Now, Ingenuity has completed 72 flights on Mars. Other countries such as Japan, China, UAE are researching Mars exploration also. In Korea, the government started to build the roadmap for Mars exploration frokm 2022. Target year for first landing on Mars is expected on 2045. This year is the 100th National Liberation Day of Korea Korea Aerospace Research Institute (KARI) also started to initial study of building preliminary roadmap of Korean Mars Helicopter based on the part of internal project in April 2023.KARI build roadmap for developing core technologies of Mars Helicotper for 18years. There are 4 major categories such as Vehicle (Platform) technology, Senor and communication, Modelling Simulation and test evaluation. KARI also studied initial sizing of Mars Helicopter to carry small payload such as soil sample return. KARI will consider the weignt of payload between 2 5kg. KARI also studied trade-off between conventional helicpter type and multi-rotor helicopter type for comparison of better mission performance. KARI also studied the required space simulator infrostructure to conduct ground test and stimulated mars environment on earch. KARI will cooperate with university and domestic company to build this natioanl roadmap and to develop core technologies. This paper will describes these roadmap, initial sizing of Korean Mars Helicoter.