

Mars Exploration (3)
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DESIGN AND IMPLEMENTATION OF ANTENNA ARRAY SYSTEM FOR CHINA FIRST MARS EXPLORATION MISSION

Abstract

China First Mars Exploration Mission will be implemented in July 2020, with the goal of orbiting and landing Mars in 2021. In order to support this mission, four 35 m antenna array system is designed and built in Kashi deep space station by Tracking Telemetry and Command (TT&C) System in the northwest of China. Three new built 35 m diameter X band antenna, with the original 35 m antenna in Kashi station, formed the antenna array system through combined signals from the Mars probe, so as to realize higher received SNR, meet the demand of TT&C and scientific data receive. From the perspective of the long-term development of China Deep Space TT&C Network, this paper analyzes the design considerations of the antenna array system, the signal combined algorithm and the future development of this system. The related technology of system implementation is introduced. Finally, the feasibility of cooperating with other space agencies for cross supporting by long distance antenna arraying in the future deep space exploration mission is prospected.