

SPACE EXPLORATION SYMPOSIUM (A3)  
Mars Exploration – missions current and future (3A)

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ORBIT DESIGN FOR THE MARTIAN MOON IMPACT MISSION

**Abstract**

Multi-objective mission is the trend of deep space exploration. Mars has two natural satellites. The mission that exploring Mars and implementing the impacting or landing on one moon of Mars is one of the best choices for China's Mars exploration in its early stage. The Martian moons are too small. Therefore, the probe needs more accurate navigation information in the Martian moons exploration. However, the ground-based navigation system is too far to satisfy the demand of navigation accuracy and real-time performance. Therefore, apart from the precise orbit design, the autonomous navigation capability is also essential in this probe.

One available solution to the Martian moon impact mission is, the Mars orbiter releases the moon impactor after finishing the major mission, while the orbiter itself becomes an observer in the impact process. The corresponding orbital transfer solution for the impactor and the observer is presented under the condition of optimal visibility of target. The simulation proves the feasibility of this solution.