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SPACE EXPLORATION SYMPOSIUM (A3)
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OVERVIEW OF CHINESE CURRENT EFFORTS FOR MARS PROBE DESIGN

Abstract

Mars exploration activities have gathered scientific data and deepened the current understanding about the Martian evolution process and living environment. As a terrestrial planet, Mars is also an excellent proving ground of some innovative special-purpose aerospace technologies. In the U.S., Soviet Union (Russia), Europe, and India, missions sending spacecraft to explore Mars currently exist, and the first three have landed their spacecrafts on the surface of Mars. China has programmed five Mars landing missions in next 20 years, and some critical technologies for Mars landing mission have been studied beforehand. In this paper, we will report Chinese Mars exploration mission scenario and the latest progress in dynamics study and guidance navigation and control (GNC) system design for Chinese first Mars probe. Some elementary design rules and index will be described according to simulation experiments, analysis and survey. Several new coping strategies will be proposed to be competent for the challenges of the Mars entry descent and landing (EDL) dynamics process. Details of the work, the supporting data and preliminary conclusions of the investigation will be presented. Based on our current efforts, one candidate system configuration architecture of Chinese first Mars probe will be shown and elaborated in the end.