

HUMAN EXPLORATION OF THE SOLAR SYSTEM SYMPOSIUM (A5)  
Human Mars Exploration (2)

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DEVELOPMENT AND SPACE APPLICATION OPPORTUNITIES OF INFLATABLE  
ENTRY/RE-ENTRY DECELERATORS

**Abstract**

The new lightweight inflatable Entry/Re-entry decelerators technology has been demonstrated in several flight tests in Russia and America. This technology is designed to reduce the mass and cost of future entry/re-entry systems for Earth and planetary, which has been in the focus of on-going engineering activities in support to future interplanetary missions. This paper outlines the development and further application opportunities with the definition of an operational Satellite Download System and the Entry, Descent and Landing (EDL) on Mars. This paper summarized the status of inflatable entry and descent technology of Mars Lander, a scheme was then presented for a 360kg class Mars lander, which was executed in the form of a bladder of a conical shape. The preliminary system design, geometry and working principle of the entry and descent system was introduced. A simulation study was carried out to investigate dynamic properties of the lander structure. Key technologies associated with the entry and descent system were presented and the approaches to solve these key problems were given.