RECONSTRUCTION OF ENTRY, DESCENT, AND LANDING COMMUNICATIONS FOR THE 2007 PHOENIX MARS LANDER (IPPW-7)

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ABSTRACT

The Phoenix spacecraft landed successfully on 25 May 2008 on the northern plains of Mars to conduct a three-month study of the Martian environment. NASA levied a requirement on the Phoenix Mars Lander to provide spacecraft communications during entry, descent, and landing to allow the identification of probable root cause in case of a mission failure during this event. The talk briefly reviews the constraints and degrees of freedoms in designing an entry, descent and landing communications link and presents Phoenix's novel and robust implementation approach to entry, descent, and landing communications. It then presents a comparison of the actual versus the expected EDL communications performance using data collected by the Mars Odyssey, Mars Reconnaissance and Mars Express orbiters as well as by terrestrial ground stations. The overall lessons learned and conclusions described herein can serve as a pathfinder for the entry, descent, and landing communications architecture and implementation of future Mars landed missions.