

Abstract

“Engineering Constraints on Mars Exploration Rover Landing Site Selection”

Mark Adler

Mars Landing Site Selection Workshop

October 17, 2001

Pasadena, CA

The selection of the Mars Exploration Rover landing sites is constrained by the system capabilities for descent, landing impact, egress of the rover from the lander, and the surface mission solar energy and thermal control. These constraints are expressed in this talk relative to landing site characteristics in terms of site altitude, sustained wind and wind shears, slopes at three characteristic length scales, rock abundance, thermal inertia, albedo, and site latitude. These characteristics have to be met over the majority of a selected landing site, defined by the landing targeting dispersions. The landing dispersions are driven by the approach navigation accuracy, atmosphere density uncertainty, system drag uncertainty and variation, and winds. The landing dispersions vary with the mission and the target latitude and are provided in this talk. Landing site selection will also take into account mission return considerations presented in this talk, such as the available energy for activities, available data return, mission lifetime, and the ability of the rover to conduct traverses in the expected terrain.