Propagation Issues for Communications on and around Mars
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Abstract: This paper reports on on-going work at JPL for an in-depth understanding of
radio wave propagation issues for communications on and around Mars for cost effective
design of future mission for robotic and human exploration of the planet. The study
examines signal attenuation and multi path near the surface of Mars for the 0. 4 GHz /30
GHz range and considers the impact of these phenomena on communication links
between orbiter to rover and rover to base-station. The impact of the Martian
environment including the ionosphere, atmosphere, global dust storm, aerosols, clouds,
and geomorphologic features on signal attenuation is presented. The study also examines
signal multi-path on the Mars surface. The sensitivity of signal attenuation and multi-
path versus frequency is studied for the 0. 4 GHz /30 GHz range. Research reported by
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