

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Near-Earth and Interplanetary Communications (3)

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IMPLICATIONS OF SKY RADIANCE ON DEEP-SPACE OPTICAL COMMUNICATION LINKS

Abstract

As the number of deep-space missions that are turning to optical communications to support science operations increases, system designers are taking a more in depth look at the link budgets that govern such links. Noise sources, such as the radiance arising from scattering in the Earth's atmosphere and light reflected from planetary bodies in close visual proximity to spacecraft, become particularly critical given the photon-starved channels normally associated with deep-space links. In the case of the Earth's atmosphere, sky radiance becomes a significant factor when considering daytime operations especially when operators need to support spacecraft contacts close to the Sun. This paper encapsulates the implications of sky radiance on deep-space optical communication scenarios and provides an overview of the current efforts underway in Europe to further quantify its impact on future mission operations.