

**Technology, Data Bases and System Analysis for  
Space-to-Ground Optical Communications**

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**ABSTRACT**

Optical communications is becoming an ever-increasingly important option for designers of space-to-ground communications links, whether it be for government or commercial applications. In this paper the technology being developed by NASA for use in space-to-ground optical communications is presented. Next, a program which is collecting a long-term data base of atmospheric visibility statistics for optical propagation through the atmosphere will be described. Then, a methodology for utilizing the statistics of the atmospheric data base in the analysis of space-to-ground optical communications links will be presented. This methodology is useful when comparing optical communications with microwave systems, it takes into account the effects of station availability, and it provides a rationale for the establishment of the recommended link margin.