

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
Advanced Systems (6)

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APPLICATION OF COMPOUND PARABOLIC CONCENTRATOR IN SPACE-BASED LASER  
COMMUNICATION**Abstract**

With the extensive application of space-based laser communication, there is an urgent need to develop a high-gain antenna to collect fuse for improving S/N Ratio and enhancing communication distance. Compound parabolic concentrator (CPC) is a non-image concentrator based on the theory of edge optics. Through researching the structure of CPC and its capability of collection, CPC used in the space-based laser communication can enhance the fuse signal effectively. We use the method based on Monte Carlo to simulate the situation of applying CPC in space-based laser communication system. There are mainly four types of receivers with which CPC can combine. They are flat type, vertical type, triangle type and tubular type. It is the flat receiver that we use to study in optical scattering communication system. When the elevation ()and angle()of the transmission are the same as 60o ,the distance is 1km, the visibility is 10km, the method based on Monte Carlo tracked photoes of non-line-light transportation. we simulated light energy which the flat receiver received and photoes flying time in two situations, with CPC and without CPC. The simulation shows the pulse response cueves of the two situations. The simulating results shows that CPC which used in space-based laser communication system can increases effectively receiving fuse light energy, inhence, the communication distance can be longer than ever.