

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
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DESIGN OF KA BAND WEAK SIGNAL RECEIVER FOR SPACE COMMUNICATION PAYLOAD IN
HIGH DYNAMIC ENVIRONMENT

Abstract

With the development of the space communication, the Ka band spread spectrum measurement and control will become one of the key technologies in the future. In this paper, a Ka band spread spectrum receiver is designed to realize the acquisition and tracking of weak signal in the high dynamic environment. Because of the wide bandwidth of the Ka band, it can provide a larger channel capacity than the S band. However, the receiver working in the Ka band needs to greatly shorten the acquisition time. So the receiver needs higher acquisition and tracking dynamic performance requirements for Ka band spread spectrum reception. Taking into account the requirements of the acquisition and reception of the near earth orbit and the medium and high orbit satellites, the spread spectrum receiver in the Ka band needs to capture and track at very low snr. According to the idea of software radio, the design of integrated baseband platform could be used to reduce the hardware resources. And the design of Ka band spread spectrum receiver is aimed to improve the performance of acquisition and tracking for space communication application.