IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advanced Space Communications and Navigation Systems (2)

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CRITICAL DESIGN RESULTS OF ENGINEERING TEST SATELLITE 9 COMMUNICATIONS MISSION: FOR HIGH-SPEED LASER COMMUNICATION, "HICALI" MISSION

Abstract

Recently, satellite broadband communication services using Ka-band are emerging all over the world, some requiring capacities in excess of 100 Gbps. With the radio bandwidth resources becoming exhausted, high-speed optical communications can be used instead to achieve ultra-broadband communications. The National Institute of Information and Communications Technology (NICT) in Japan has over 20 years of experience in RD of space laser communications with missions such as the Engineering Test Satellite VI (ETS-VI), OICETS, and SOCRATES/SOTA. We are currently developing a laser communication terminal named "HICALI" (HIgh speed Communication with Advanced Laser Instrument), aiming to achieve 10 Gbps-class space communications with a 1.5 m-band laser beam between optical ground stations (OGSs) and the next-generation high-throughput satellite called ETS-IX with a hybrid on-board communication system using radio and optical frequencies, which will be launched into the geostationary orbit in 2021 In

this paper, we describe the critical design results of “HICALI” mission for ETS-IX.