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PROSPECT FOR NEXT-GENERATION HIGH SPEED SATELLITE NETWORKS BASED ON
INTER-SATELLITE OPTICAL COMMUNICATION IN CHINA

Abstract

With the continuous successful space experiments of satellite optical communication in Europe Japan China et al, it is feasible and irresistible to establish high speed optical satellite network, driven by the increasing data rates demands in commercial and military applications. Over the next several years, for the benefit of earth environment China will launch many satellites, including weather forecast satellite, high resolution earth observation satellite and communication satellite. Taking consideration of that the disasters are always abrupt, urgent and stochastic, it is necessary to survey the earth environment detailedly and immediately for overall 24 hours in different season. Hence, the transmission data rate should be as high as possible. Inter-satellite optical communication is a promising solution, with characteristic of higher data rate, low probability of intercept, no restriction for frequency use, less volume, less mass, less power consumption and so on. An important prerequisite to promote inter-satellite optical communication into overall practical application is the development of smart optical communication terminals. In this paper, the first Chinese space satellite optical communication project of H2 is reviewed. Then the architecture of satellite optical network, which involving different kinds and orbits of satellite, is prospected. And the advantages of application inter-satellite optical communication in weather satellite, high-resolution earth observation satellite and communication satellite are discussed. It shows that the communication performance will be highly enhanced introducing inter-satellite optical communication. And the technologies of satellite optical terminals still need to be improved in China.