IAF SPACE OPERATIONS SYMPOSIUM (B6)
Ground Operations - Systems and Solutions (1)

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APSCO MULTI-FUNCTIONAL DISTRIBUTED GROUND STATION NETWORK AND APPLICATION

Abstract

The small satellites in low earth orbit (LEO) have played an important role in the fields of space remote sensing, communication, scientific exploration, new technical demonstration and society public services. The ground station (GS) is the key ground facilities to track satellite, receive telemetry data package and send telecommand. But the GS has two bottlenecks. One is the TTC coverage limitation, another is the low efficiency service of GS. In order to solve the two problems and ground support APSCO Student Small Satellite (SSS) project, which is the largest basic activity of in-orbital micro/nano-satellite technology demonstration and the hand-on practice space engineering training program in APSCO(Asia-Pacific Space Cooperation Organization), Beihang university proposed and established the APSCO GS network based on the obtained UHF/VHF band and/or S/X-band ground stations which are distributed in APSCO member states. In this paper, it surveyed the established global G.S. network. It presented the GS network system design, network topology and interface design. APSCO G.S. network is mainly composed of mission control center (MCC), Data Process and Archive Centre (DPAC) and various member states ground station nodes. When connecting with the different ground station nodes, the G.S. specific interface is designed. In order to schedule G.S. resource allocation, management plan, receive satellite telemetry data and payload data, generate the satellite telecommand, and provide international space technology engineering practice education and training. At present, the established GSN already supplies the service for some in-orbit small satellites. It also works as the international space education and space engineering training platform for young students from Belt Road countries.