

SPACE OPERATIONS SYMPOSIUM (B6)
Mission Operations, Validation, Simulation and Training (3)

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X-BAND ANTENNA TRACKING PARAMETER FILE GENERATION METHOD FOR
MULTI-SATELLITE OPERATION SYSTEM

Abstract

A ground system for LEO satellites plans contact schedules for image downlink and generates tracking parameter files for X-band antenna operation. The X-band antenna points the ground station by moving azimuth and elevation of the antenna assembly according to the tracking parameter file during contact time. If the ground station operates more than one satellite, there might be several constraints of the ground antenna operation. When two or more satellites approach to the ground station, it could be possible to allocate separated contact time to each satellite or to use separated ground antenna for each satellite. If we use several ground antennas, it is necessary to avoid RF interference from unwanted signal of the other satellite. If the position of the satellites are very close and simultaneously transmit the image data in the same frequency, ground stations for each satellite should be located far away from each other. The X-band antenna of each satellite also should point the optimal ground position to minimize the RF interference. In this paper, we suggest the method to operate X-band antenna for multi-satellite operation. We describe how to receive the image data from sequentially approaching satellites by using two ground antennas in a similar position. Then we describe how to use geographically separated two ground antennas to receive the image data from simultaneously approaching two satellites. The experimental results show the proposed method successfully generates the tracking parameter files for the X-band antenna which satisfies the dynamic constraints and effective beam width constraint.