

EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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ANALYSIS ON FACTORS AFFECTING IMAGE FORMATION OF GEO OPTICAL REMOTE
SENSING SATELLITES WITH HIGHER RESOLUTION

Abstract

In order to meet the demands of high-temporal and high-spatial resolution data of remote sensing satellites in fields of environment, resources, meteorology and disaster mitigation etc., many countries are successively researching and developing novel geostationary optical satellites with higher resolution. GEO meteorological satellite of international advanced research at present has reached 500m spatial resolution, and the spatial resolution of earth observation satellite in future will also be risen into 60m. With the rising of orbital altitude and spatial resolution, earth observation of GEO optical satellites will face new changes and possess new features. The imaging region, targets on heterogeneous landscape, intensity of solar radiation, atmospheric models and transmission characteristics, and imaging devices on focal plane have become important influence factors in which whether GEO satellites can realize earth observation and image formation. In this article, we conceived of launching a GEO optical imaging satellite with high resolution located nearly in longitude 108 degrees east and combined with imaging requirements for latitudes 0-60 degrees north, to analyze the features of solar radiation intensity with variation of seasons. Applying MODTRAN radiation transmission software and adopting the corresponding Asia atmospheric transmission model, we mainly complete the analysis on factors affecting image formation of visible bands. We also obtained the dynamic range of incoming solar radiation at entrance pupil of camera and put forward requirement of signal-noise-ratio (SNR) of imaging devices on focal plane. Simulation calculation and analysis this results indicate that the novel GEO optical satellite can realize earth observation on latitudes 0-60 degrees north and meet the requirement of spatial resolution of sub-satellite point. This analysis will establish the technology foundation for the on-going research and development of GEO optical earth observation satellites with higher resolution.