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EFFECTIVENESS EVALUATION OF LOW-ORBIT LARGE-SCALE EARTH OBSERVATION
SATELLITE CONSTELLATION TO GROUND TARGETS

Abstract

Low orbit microsatellite has the advantages of low cost, short development period and easy deployment in orbit. Large-scale low-orbit satellite constellation based on micro-satellite is an important development direction of Earth observation satellite system in the future. Based on the Earth observation satellite system built on the low-orbit giant constellation, this paper carries out the prediction and evaluation of the reconnaissance efficiency of ground targets. This supports the forecast, assessment, and rapid calculation of security windows for ground targets from space reconnaissance effects. First of all, taking the typical civilian and commercial earth observation satellite constellation as reference, the construction of the observation model of the satellite constellation to the ground is carried out. Secondly, the satellite observation effect assessment calculation model for ground targets is designed, and then this is used to support the prediction and evaluation calculation of reconnaissance effects to any ground point target. The evaluation model takes into account the effects of satellite load performance, weather environment and other factors. Finally, based on the above research, the grid solution method is used to carry out the prediction and assessment of observed effects in the ground area of interest, and the calculation results of observed effects within a certain period of time are shown in the form of dynamic heat map. The research of this paper can provide support for the planning of future high value activities on the ground.