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The Strategy of Orbit Avoidance for Optical Remote Sensing Satellite

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Abstract : Optical remote sensing satellite, always running on the Sun-synchronous orbit, equipped laser warning equipment to alert CCD camera from laser attack. There have three ways to protect the CCD camera, closing the camera cover satellite attitude maneuver and satellite orbit avoidance. In order to enhance the safety of optical remote sensing satellite in orbit, this paper explores the strategy of satellite avoidance. The avoidance strategy is expressed as the evasion of pre-determined target points in the orbital coordinates of virtual satellite. The so-called virtual satellite is a passive vehicle which superposes a satellite at the initial stage of avoidance. The target points share the consistent cycle time and the same semi-major axis with the virtual satellite, which ensures the properties of the Sun-synchronous orbit remain unchanged. Moreover, to further strengthen the avoidance capability of satellite, it can perform multi-object avoid maneuvers. On occasions of fulfilling the orbit tasks of the satellite, the orbit can be restored back to virtual satellite through orbit maneuvers. There into, the avoid maneuvers adopts pulse guidance. and the fuel consumption is also optimized. The avoidance strategy discussed in this article is applicable to avoidance for optical remote sensing satellite when encounter the laser hostile attacks.

Keywords : optical remote sensing satellite, always running on the sun-synchronous
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