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ORBIT MAINTENANCE STRATEGY WITH CONJUNCTION AVOIDANCE

**Abstract**

Some Low Earth Orbit satellites carry propulsion systems for orbit correction. One of the common uses of such propulsion systems is to compensate for the orbit decay caused by atmospheric drag. Another use of the propulsion system is to initiate a reactive respond to avoid collision with another satellite or debris. This paper describes an orbit maintenance strategy which includes conjunction analysis. The strategy combines orbit maintenance operations with conjunctions avoidance so as to minimize fuel consumption while achieving both goals of maintaining orbit height and reducing risks of conjunctions.

This strategy is demonstrated using an orbit maintenance case scenario of TeLEOS-1, a 400kg earth observation satellite with electric propulsion, to be launched in 2015. A baseline orbit maintenance operations plan is generated with the objective of raising the orbit to a desired height. Next the plan is screened against a catalog of objects in space and possible conjunctions are flagged when miss distance falls below a threshold. Some orbit maintenance operations are then rescheduled so that the predicted miss distances will exceed the chosen threshold.