

20th SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
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A NOVEL ON-ORBIT SERVICING TECHNOLOGY BASED ON MICROSATELLITE PLATFORM

Abstract

On-orbit servicing (OOS) is a part of an emerging category of future on-orbit activities that are critical for taking the next leap in our use of Earth orbit, especially in Geostationary earth orbit. The ability to repair or refuel satellites, construct new satellites in orbit, and even assemble large space facility can help drive innovative uses of space. Combined with the rapid development of the microsatellite technology, a novel microsatellite swarm robot servicing system (MSRSS) is designed, which consists of one communication robot, two servicing robots (two robot arms), and two monitor robots. All the robots in the system are designed based on microsatellite platform, and collaborated to execute monitoring/measuring, capture, maintenance, repair and other tasks, at the same time, some module satellite can be used as part of a satellite to replace the existing module. This new program can solve the deficiency of a single large robot satellite, and microsatellite-based platform can reduce costs and improve the fast response. The use of microsatellite in OOS includes two aspects: (1) the formation of micro-Swarm robots in OOS instead of a single large space robot platform; (2) as part of the servicing object (such as U.S. Phoenix).