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ACTIVE DEBRIS REMOVAL OF LARGE-SIZED SPACE DEBRIS FROM GEO PROTECTED
REGION

Abstract

The problem of space debris (SD) active removal has been actively considered for more than 5 years. A large number of works are devoted to removal of large-sized SD objects from LEO protected region which is due to high probability of collisions and potential for emergence of "Kessler Syndrome" in this region of near-Earth space. However, no less acute is the problem of SD removal from GEO protected region. Large-sized SD objects in geosynchronous orbits can be located almost infinitely long time periodically changing orbital parameters, so that their active removal to disposal orbits is the only possible method for GEO protected region remediation. TSNIIMASH together with RIAME MAI and JSC "ISS" works on specialized S/C for SD removal from GEO region with using of "Ion Shepherd" method since 2013. To date pre-defined parameters of S/C design and injection system of ion beam, analyzed orbital transfers and S/C-SD motion control, estimated magnitude particles reverse flow and analyzed potential objects for active removal from GEO protected region to disposal orbits. In this work will summarize results, conclusions and recommendations obtained as a result of years of research in this area.