

29th IAA SYMPOSIUM ON SMALL SATELLITE MISSIONS (B4)
Generic Technologies for Nano/Pico Platforms (6B)

Author: Prof. Hae-Dong Kim
Gyeongsang National University, Korea, Republic of, haedkim@gnu.ac.kr

Mr. Wonsup choi

Korea Aerospace Research Institute (KARI), Korea, Republic of, wchoi@kari.re.kr

Dr. Min-ki Kim

Korea Aerospace Research Institute (KARI), Korea, Republic of, mkkim@kari.re.kr

Mr. Jin-Hyung Kim

Korea Aerospace Research Institute (KARI), Korea, Republic of, hjkim@kari.re.kr

Dr. Kiduck Kim

Korea Aerospace Research Institute (KARI), Korea, Republic of, kiduck@kari.re.kr

Mr. Jisuck Kim

Korea Aerospace Research Institute (KARI), Korea, Republic of, jskim@kari.re.kr

DEVELOPMENT AND DEMONSTRATION OF RENDEZVOUS/DOCKING TECHNOLOGIES USING
NANOSATELLITE

Abstract

The technological advances of nanosatellites have made it possible to use high-level space technologies such as rendezvous/docking technologies as effective and excellent tools to test in space at a low cost. In particular, rendezvous/docking technology is a common core technology of space debris active removal(ADR) and On-orbit serving(OOS), while testing in space using medium and large satellites requires enormous risks and development costs. In Korea, technologies related to rendezvous/docking, which are very important in developing asteroid exploration, which is to be planned after the lunar probe mission this year, are also developed using nanosatellites. Since 2018, the KARDSAT(KARi Rvd Demonstration nanoSATellite), which is being developed for the first time in Korea, is developing and plans to test rendezvous/docking technologies such as proximity operations, precision relative navigation technology, and ultra-small thrust technology, and drag device for orbit disposal at the end of the mission by launching two nanosatellites (Chaser and Target satellites) into space., For this purpose, this paper introduced the system of KARDSAT under development and addressed the results of proximity operations and docking tests performed on the ground. In particular, various constraints were also introduced in performing rendezvous/docking ground tests using nanosatellites with limited volume. The KARDSAT plans to launch it as a payload for Korean space launchers under development in Korea in the near future and plans to expand rendezvous/docking technologies developed using nanosatellites to ultimately develop full-scale space debris sweeper satellites and On-orbit servicing satellites.