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THE ADAPS AS A GRADUALLY DEVELOPING BALLISTIC DATA PROCESSING SYSTEM

Abstract

The ADAPS (Autonomous Dangerous Approach Prevention System) is a ballistic data processing system developed by specialists of Keldysh Institute of Applied Mathematics (KIAM RAS) from 2013. The main objective of this system is processing optical measurements obtained by International scientific optical observation network (ISON) telescopes to study the space debris population and ensure the safety of spacecraft flight.

Currently the system has a sophisticated web-interface and a various software tools for operators with different access levels. A wide set of information exchange protocols provides the real-time interaction with optical telescopes and their observers, analysts and consumers of ballistic data. The ADAPS system maintains its own orbital database, updated with optical measurements and data from other sources, and provides different types of observations planning.

During 2015 an array of ADAPS servers have processed more than fifteen million astrometrical measurements collected by eighty ISON telescopes of the different class (apertures from 12.5-cm to 2.6-meter).

Every day the system automatically calculates and provides operators with several hundred warnings about possibly dangerous approaches in near-Earth space at an altitude from 150 to 50 thousand kilometers.

The ADAPS development was made possible by the bold experience of KIAM RAS in mathematical modeling and programming areas.