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CURRENT IMPROVEMENTS OF THE ISON NETWORK TO SUPPORT THE COLLISION PREDICTION TASK

Abstract

Currently the ISON network collaborates with 23 observatories and observation facilities in 10 countries and provides regular observations of objects across whole GEO. 33 telescopes during 2127 telescope-nights provide 1.15 million measurements in 120 thousands tracklets on about 2000 objects to KIAM database in 2009. KIAM maintains now the orbits of 1467 objects in GEO region including 391 operational and 501 non-functional spacecrafts, 250 upper stages and 325debris fragments and undetermined type objects.

Last year a part of the ISON was involved in the Roscosmos project "Automated System for Prediction and Warning on the dangerous situations in the near-Earth space". In this system KIAM is responsible for the prediction of the dangerous situations at high orbits. This task requires high level of orbital data quality. Usually it means that approaching object's orbit accuracy should be at the level of 2-3 km position error for in-track, better than 1-2 km for radial and 0.5-1 km for cross-track direction. The accuracy of measurements which ISON produce is enough to obtain such level of errors at orbit determination and propagation for the majority of GEO objects. But due to restricted observation time which optical sensors have to observe each individual GEO object it is not easy to keep this level of accuracy for all of objects all the time.

Therefore the work on improvements of the ISON network was started and partially implemented in 2009. Main efforts are concentrated on finishing the ISON subset from nine automated telescopes of 22 cm class with wide field of view which must provide the regular surveying the GEO in large width to increase the regularity of object observations. Secondly the forming of new subset for tracking of individual GEO and HEO objects on long measuring arc is began of 20-40 cm aperture telescopes to increase the precision of measurements and orbital solutions. The results of this work are presented in the paper. It is partially supported with RBFR 09-01-00566 and 09-01-13540 grants.