

SPACE DEBRIS SYMPOSIUM (A6)
Measurements (1)

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THE FIRST ITALIAN-RUSSIAN OBSERVATORY FOR SPACE DEBRIS MONITORING

Abstract

In October 2006 the Italian Space Agency, in the framework of an activity which involved different Italian groups working on space debris, committed to the Group of Astrodynamics of the University of Rome "La Sapienza" (GAUSS) the task to manufacture a small and easy to transport observatory completely dedicated to space debris monitoring. The first Italian space debris observatory (SPADE) started its activity in 2007 and optical observation campaigns of LEO and GEO objects are performed on a regular basis. The observatory SPADE is located in Colleparado, near Rome. After this first step and due to the increasing of the Italian operative satellites in orbit (Cosmo-SkyMed constellation, SICRAL-2), the Italian Space Agency proposed to improve the National observation capability installing a new observatory in cooperation with the Keldysh Institute of Applied Mathematics (KIAM) of Russian Academy of Sciences (RAS) of Moscow. In the summer of 2009 a team of Russian and Italian researchers cooperated to install it in Colleparado. FIRST, First Italian Russian Space debris Telescope, was also included in the ISON network (International Scientific Optical Network) for the near-Earth space surveillance of the KIAM of Moscow. The FIRST observatory is based on a 22 cm telescope with a modified Cassegrain configuration and a 4K x 4K pixels CCD. The field of view is about 4 by 4 degree. The mount is an equatorial EQ6 able to support 25 kg of weight, with a tracking velocity greater than 3/sec. The robotic mounts, fixed to an Aluminum column, permits full autonomous tracking mode and the observatory can be remotely controlled. The shutter is controlled by a GPS board, in order to achieve a very precise timing, as required to perform the accurate orbit determination of the tracked objects. Two computers are used: one is dedicated to the robotic mount and CCD control, whereas the second one is dedicated to the image analysis. The software for the observatory control and image analysis were developed by researchers which collaborate with KIAM. The observatory is movable: it can be disassembled and re-assembled in one day. The paper gives a description of the observatory and presents the results achieved during the first eight months of activities of the first Italian Russian observatory dedicated to the space debris monitoring.