

SPACE DEBRIS SYMPOSIUM (A6)
Interactive Presentations (IP)

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EQUO: AN EQUATORIAL OBSERVATORY TO IMPROVE THE ITALIAN SPACE SURVEILLANCE
CAPABILITY**Abstract**

The need to improve observation capabilities in monitoring and cataloguing space debris is constantly growing, due to the continuous increase of operative satellites in both GEO and LEO regions. Recent break-ups events in Low Earth Orbit (LEO) (i.e. IRIDIUM 33 – COSMOS 2251) encourage the European States and also Italy to further improve their capabilities in space debris environment surveillance. Thus, in order to increase space debris observation potential, the opportunity to establish a network, including observatories outside of Europe, has been considered as essential. For these reasons, the Italian Space Agency (ASI) and the Department of Astronautics, Energetics and Electrical Engineering (DIAEE) of "La Sapienza", University of Rome, decided to establish an equatorial observatory settled at the Broglio Space Center in Kenya (EQUO – EQUatorial Observatory). The paper describes the tools developed to optimize the design of the system, based on a software capable to simulate the images taken by different configurations of CCD and Telescopes. As far as the different types of telescopes are concerned, properties such as focal length and diameter are considered in this paper. Regarding the CCDs, they are widely used in astronomic observation and their technical specifications, such as dimensions, chip-size and quantum efficiency, are also considered in this paper. Besides the manufacturing of the observatory, an analysis has been performed on the complementarity of this system with an observatory located in Italy. As far as space debris detection and tracking are concerned, the enhancements with respect to the use of a single telescope located at mid latitude regard surveying volume, object identification and orbital determination accuracy are discussed for different orbital regimes.