

15th IAA SYMPOSIUM ON SPACE DEBRIS (A6)
Interactive Presentations (IP)

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ON THE SPACE DEBRIS OPTICAL ARCHIVE AT THE ITALIAN SPACE AGENCY

Abstract

The Italian Space Agency (ASI) participates to the ESA Space Situational Awareness (SSA) Programme and is member of the Inter-Agency Space Debris Coordination Committee (IADC). In this context ASI started an extended campaign to observe and characterize space debris. Owing to a fruitful collaboration with the National Institute for Astrophysics (INAF), several Observatories are involved at different latitudes (Lat 37° – 46° N) and longitudes (Long 11° – 17° E). In order to investigate a wide area of orbital regions, from the high LEO up to the GEO altitudes, optical sensors are used. The ASI observational campaign is focused on discovery, follow-up, orbital reconstruction and physical characterization of the surface materials of space debris. To accomplish this last goal, optical spectroscopy and multi-band photometry in Johnson (BVRI) bands are used. In particular, the optical observations are based on Charge-Coupled-Devices (CCD) FITS standard images and are collected and processed in local storages. The data processing system starts from level 0 to create level 1 and level 2 high-quality data products. The choice of a local processing system allows the development of specific software for data reduction and calibration, taking into account the characteristics of each observational instrument. Moreover, autonomous calibrations to standard reference systems are applied, providing independent measurements for further scientific analysis. In order to provide the online distribution through a unique interface, a central high-quality archive is going to be populated with the post processed data products. The issues related to the data preservation and distribution will be addressed by taking the advantageous experience of the Space Science Data Center (SSDC) facility of ASI. In the paper, the steps followed to create the post processed (high-quality) archival structure, starting from the acquisitions of raw optical data, will be described. In particular, multiband photometric data will be specifically treated.