Maintaining the Geostationary Objects Catalogue using Relational Database and THEONA software

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Increased attention for last decade on studying of near-Earth artifical space objects is caused by whole number of practical tasks, especially, providing of safety of spaceflights. Due to this some issues of space control are appeared. However, information needed for detailed analysis in some situations is presented as rule in different forms and in different sources. Special information model was elaborated during 1994-98 for purposes of collecting, formalization, storing, generalization and analysis various information concerning of space activity, and also for providing some space control and space analysis tasks with such information. This model permits to describe any artifical space object and it's evolution in the course of time in common terms of 'object' and 'event'. It is foreseen that there is a possibility of adding other characteristics of 'objects' and 'events' in case of need. The model was applied for creating of the relational database named 'CATALOGUE OF SPACE OBJECTS'.

At present, each space objects and space event may be described by around of 180 parameters in total. Special database structure permits to store information for the same parameter of a particular object from different sources. It is possible, that this information is contradictory

or have different accuracy. In these cases it is possible describe degree of contradictory and store all source references on each particular value. At present, the database contains information about launches (including orbital, suborbital, failed and planned), known space objects resulting from these launches (independently of current their existence or tracking status) and so on. Also, following 'events' are described: docking, fragmentation, manoeuvres, decay and so on. Formal description of object

and event types permits to extend possible ones without changing of the database structure. The "CATALOGUE OF SPACE OBJECTS" has a lot of applications. One of them is support of analysts and operators with processing of tracking and other information for geostationary objects. Currently there are more than 800 objects in near-geostationary region. The "CATALOGUE" include not only procedures for filling tables with various data but for analysis and effective automatic processing. Main tasks are: - processing of tracking measurements with THEONA software; - identification of newly observed objects; - maintaining of processed orbital data archive for whole time of each near-geostationary object existence; - maintaining archive of predicted orbital data for quick analysis of current measurements; - planning of observations of objects; - maintaining archive of IERS data; - using general data on space object from the "CATALOGUE" (launch data, geometry of object, stabilization and external satellite constructions data, possible locations for satellite of given type etc.) during analysis; - visualization of evolution of orbital elements, observation conditions etc.; - preparation of various type reports.