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LOOKING INTO THE FUTURE: THE CASE FOR AN INTEGRATED AEROSPACE TRAFFIC
MANAGEMENT

Abstract

Space Traffic Management (STM) is being developed to deal mainly with the problems of satellite operations and space debris. Therefore, currently is being examined separately from air traffic management (ATM). However, the advent of reusable space vehicles (RLVs) and the increase of private spaceflight operations calls for a joined examination of the STM with ATM. Among others, airspace will be shared by both aircraft and RLVs, while outer space traffic in Low Earth Orbit (LEO) will increase and begin resembling air traffic. At the same time, modernization of ATM worldwide focuses also on satellite-based navigation. Therefore, developing a comprehensive AeroSpace Traffic Management (ASTM), to include both aviation and LEO space flights, could be useful. In this regard, some core concepts and technologies already developed or under development for ATM could set a useful example. The *Automatic Depended Surveillance – Broadcast* (ADS-B) technology uses satellite navigation to locate the position of a given aircraft and the aircraft flying nearby, and transmit it to other aircraft and the Air Traffic Control (ATC). *4d-trajectory management* is based on the integration of time into the 3D aircraft trajectory, to ensure flight on a practically unrestricted, optimum trajectory for as long as possible, provided that the aircraft meets accurately an arrival time over a designated point. The *System Wide Information Management* (SWIM) concept envisages prompt and efficient data sharing among airspace users and Air Navigation Services Providers (ANSPs) through a wide-array network or a centralized flight data processing system. Such concepts and technologies could prove useful to regulate spaceflight traffic to and from LEO as well as coordinate such traffic effectively with air traffic. Moreover, developing an efficient ASTM system requires designating competent authorities, which will supervise the service providers. The nature of outer space as *res nullius* resembles international airspace, which falls under the jurisdiction of no State. Air traffic in such airspace is controlled through air navigation regional agreements, which designate a specific national or transnational authority to control the airspace and ensure flight safety, without affecting the international status of the airspace. Similarly, LEO could be divided into zones, for each of which a competent authority can be designated through special international agreements. Such authorities could be linked to a SWIM, which would include both air traffic and space traffic data available to all affected authorities, service providers and aerospace users.