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Enabling safe commercial spaceflight: vehicles and spaceports (3)

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HYPLANE: A SINGLE STAGE SUBORBITAL AEROSPACEPLANE

Abstract

A HTHL bizjet-size aerospaceplane with Mach 5 is seen as more affordable than larger hypersonic systems and a larger market is also expected. It will be based on more readily state-of-art available technologies. Based on the long scientific and industrial heritage of several of its members and coherently with the Smart Specialization Strategy of Campania Region, DAC is focusing on advanced technologies compliant with a small supersonic/hypersonic business jet for suborbital flight for microgravity experimentation and training. HYPLANE is a new concept of small transportation system conceived to offer very fast flight, shortening time to connect two airports within the door-to-door target. The concept is based on the access to stratospheric altitudes (30+ km) and suborbital flights as safe as today's commercial air transportation. The reasons to propose HYPLANE are based on the maturity of the concept and its technical/economic credibility: the large amount of study performed so far demonstrates its feasibility, which mainly derives from the integration of state-of-the-art enhanced aeronautics and space technologies. Essentially, HYPLANE is mostly based on already relatively high TRL technologies which guarantees a sufficiently short time to market. The low wing loading configurations and designed ability to maneuver along the flight trajectories at small angles of attack, allow HYPLANE to guarantee accelerations and load factors of the same order as those characterizing the present civil aviation aircraft (FAA/EASA specifications). Thanks to its technical features, it may operate from/to more than 5000 airports all over the world even using short runways to take-off and land, which for point-to-point business aviation is paramount. Furthermore, characteristics such as small dimension, configuration and high cruising altitude determine reduced noise in the airports surrounding and low sonic boom impact on ground. These conditions will further facilitate not only the development of the commercial use of such kind of transportation mean, but also its social acceptability. The economic feasibility and commercial credibility of HYPLANE will be discussed.