

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Small Launchers: Concepts and Operations (7)

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FIRST RESULTS OF THE H2020 ALTAIR PROJECT – TOWARDS AN INNOVATIVE  
COST-EFFECTIVE AIR LAUNCH SYSTEM FOR SMALL SATELLITES**Abstract**

The ALTAIR project (Air Launch space Transportation using an Automated aircraft and an Innovative Rocket), which is part of the European Union's Horizon 2020 research innovation program, has been launched in order to pave the way for a future system that will contribute to Europe's independent access to space and address the market of small payloads. ALTAIR's strategic objective is to demonstrate the economic and technical viability of a future available, reliable and competitive European launch service for the access to space (Low-Earth Orbit) of small satellites in the range 50-150 kg. Indeed, there is a real need for a dedicated launch system for small satellites under 200 kg, as the market for this kind of payloads is expected to increase, while current launch options (piggy-back launch or cluster launch) are not satisfying due to their particular constraints. ALTAIR is focused on an innovative semi-reusable "air launch" system, whose carrier will be a reusable automated aircraft designed specifically for the launch mission, releasing an expendable launch vehicle at high altitude. The objective of cost-effectiveness, which is of paramount importance in the context of this project, will be achieved jointly through its concept of operations, a cost-oriented design approach for all subsystems (carrier, launcher and ground segment) and a multidisciplinary design optimisation (MDO) approach. The output of the project will be a detailed definition of the complete system, associated with a business plan as well as a development road map and an industrial organization proposal. In addition to system design work, flight tests will be conducted with the existing EOLE demonstrator (developed under ONERA's project management for the CNES PERSEUS project), in order to validate key technologies, including the launcher avionics and its release sequence. After providing a general overview of ALTAIR's approach and methodology, the paper will provide the first results, including a focus on market analysis and high-level requirements which are the input of the design tasks, and will present the current status of the preliminary design of the system.