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Access to Space for Small Satellite Missions (5)

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## VEGA FAMILY ENHANCED FLEXIBILITY FOR MULTIPAYLOAD MISSIONS

**Abstract**

The SSMS (Small Spacecraft Mission Service) program is a new multi-launch concept for the VEGA and VEGA-C launchers, thanks to a new modular dispenser for the Small Satellites Market. The VEGA Proof of Concept (POC) mission has successfully flown on September 3rd 2020, deploying 53 satellites into orbit ranging from 1 to 150 Kg from more than 10 different operators. Also VEGA VV18 has successfully flown on April 29th 2021, bringing into orbit Pléiades Neo 3 with 5 microsattellites and 4 cubesats allocated on a derived module of SSMS dispenser. The VEGA-C maiden flight (VC01), which is foreseen on May 2022, will launch Lares2 main Satellite and 6 secondary Payloads, embarked on a dedicated dispenser. The VC01 missionization process has taken advantages of the lesson learnt of the previous SSMS missions. With VEGA-C launcher three different orbits can be reached. AVUM+ can indeed perform eight boosts, three more with respect to VEGA. The higher flexibility in terms of orbital maneuvers and modularity of the SSMS system allow a great number of configurations for payload accommodation and for missions' profiles. The paper describes the SSMS system and all the possible configurations for the aggregates. Different missions will be presented, focusing on the trajectory and missionization aspects. The trajectory profiles are more complex than a standard single payload mission. Several main engine boosts are designed to release the satellites in a sequence of separations and collision avoidance maneuvers. The missionization process had to be standardized and with increased genericity (ad-hoc margin policy) to cover the continuous changes of satellites or at least of locations in the dispensers. The already flown missions represent a major advancement towards the ultimate goal to provide access to space for Small Satellites.