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CALLISTO REUSABLE ROCKET STAGE DEMONSTRATOR: STARTING IMPLEMENTATION

Abstract

A new generation of launcher is arriving in Japan and Europe with H-3 and Ariane 6 with the goal to decrease launch service cost. Both vehicles are following an expendable design. In parallel numerous projects intending to implement reusability are at different stages of development following the successes already reached in the USA. In particular the operational Falcon 9 has proven that stage reusability can be efficiently implemented and can be a good solution to further increase the competitiveness, versatility and sustainability of future launch system.

In order to understand the specificities of reusable launch vehicles in terms of design, optimization and operations, and mature the required key technologies, CNES, DLR and JAXA have decided to join their competences in the project CALLISTO (Cooperative Action Leading to Launcher Innovation in Stage Toss - back Operations). The project aims at developing, building and testing a prototype vehicle which shall, without a technological precursor, demonstrate the mastering of flights and operations representative to a reusable launch stage. Along all project phases, data and knowhow are being gained about design, manufacturing, operations and maintenance solutions, which are essential for the development of future operational vehicles.

This paper intends to give an overview about the current status of the project, which is now in Phase C. Hardware test is already well advanced and flight hardware procurement is already started. The adaptation of the Diamant launch area is on-going. Recent developments and tests for instance with respect to the approach and landing system and of the vehicle equipment bay and fairing will be highlighted and discussed in context of the upcoming steps towards the campaign starting in late 2024 at operational Europe's Spaceport CSG in Kourou.