A European scaled flying testbed for the integration of novel powertrain components

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Keywords:
scaled flight testing, flying testbed, modular test platform, alternative propulsion, scaled flight demonstration.

Abstract. The Horizon Europe project EXAELIA aims at accelerating and de-risking the development of disruptive future long-range aircraft) by using flying testbeds. One particular objective is the design of a modular flying testbed for testing promising propulsion and powertrain technologies in flight, in a relevant environment.

This paper lays out the most promising propulsion technologies contributing to significantly reducing aviation climate impact and emissions, with a particular focus on the long-range aircraft concepts designed within EXAELIA with an entry-into-service target of 2050. Furthermore, requirements for the modular powertrain testbed and the key design constraints of the test platform are lined out. On this basis, the concept of a modular, uncrewed flying testbed for the validation of novel powertrain architectures and components on a low maturity level is laid out. The paper concludes with the motivation for a roadmap to implement the EXAELIA powertrain testbed in the development process of future long-range aircraft.