

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion System (1) (1)

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LOX/METHANE REUSABLE ROCKET PROPULSION AT REACH WITH LARGE SCALE
DEMONSTRATORS TESTED

Abstract

LOX/Methane is currently regarded worldwide as a propellant combination for future expendable and reusable low cost launch vehicles.

In order to prepare for future launch systems, Airbus DS (now Airbus Safran Launchers) has been investing since a few years in research and technology of LOX/Methane engines through a demonstrator program including the design and manufacturing of a 400kN class thrust chamber, a gas generator, and a turbopump (done in cooperation with IHI of Japan).

The gas generator and the turbopump have been successfully tested respectively at the P8 DLR test facility in 2013 (Lampoldshausen/Germany) and in the IHI test facility (AIOI/Japan) in summer 2015. The TCA is following, as the test started in October 2015 at the P3.2 DLR test facility (Lampoldshausen/Germany).

The purpose of the paper is to present an overview of the main objectives that have been under investigation during these test campaigns in order to prepare future integrated test at a level of engine, and even vehicle demonstrator:

- Specific operating point for different application (Spaceplane, semi-reusable stage, idle mode...).
- Virtual engine functional analysis (trimming, mathematical model anchoring...).
- Specific vehicle related objectives (POGO, propellant quality ...).
- Preparation of potential demonstrator system tests (PowerPack and engine ACE-35R).
- ...

The first conclusions that can be derived from obtained test results is discussed in the paper.