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Author: Mr. Markus Jäger
Astrium Space Transportation, Germany, markus.jaeger@astrium.eads.net

ARIANE 5 ES ATV-2 JOHANNES KEPLER MISSION FIRST FLIGHT RESULTS IN COMPARISON TO ATV-1 JULES VERNE LAUNCH

Abstract

On the 23rd of February 2011, close to three years after the first-ever launch of the ATV (Automated Transfer Vehicle), dubbed Jules Verne, into LEO (Low Earth Orbit), ATV-2 Johannes Kepler was launched with the ARIANE 5 launcher in order to serve the ISS (International Space Station).

This paper presents the first flight results of the ATV-2 Johannes Kepler mission and compares the data with ATV-1 Jules Verne post flight analysis. The focus within the comparison is put on the FPS (Functional Propulsion System) behavior of the ARIANE 5 upper stage EPS (Etage à Propergols Stockables). Also the Engine re-ignition behavior in flight under different thermal conditions is given and explained by taking into account measurement data from qualification and acceptance hot firing tests on ground.

Then the status of the adaptation activities of the ARIANE 5 launch vehicle towards the deployment of Galileo navigation satellites is shown. The adaptation is based in principle on two different aspects: Dry mass optimization of the VEB (Vehicle Equipment Bay) in order to fulfill the performance requirement and functional verification of the EPS upper stage towards the reference mission profile into a MEO (Medium Earth Orbit).

Finally an outlook is given on the next ARIANE 5 missions in the ES version using the EPS re-ignitable upper stage.

The content of this paper is new and was hence not presented at previous conferences. Also the attendance of the authors in Cape Town, South Africa to deliver the paper is assured.