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Paper Title:	IXV System experimentation and mission performance
Abstract:	<p>In the complex domain of the space technologies and among the different applications available in Europe, a great interest has been placed since several years in the development of re-entry technologies. IXV (Intermediate eXperimental Vehicle), as part of the ESA Future Launchers Preparatory Programme (FLPP), takes advantage from these past experiences and it is conceived to be the next technological step forward with respect to previous European ballistic or quasi-ballistic demonstrators.</p> <p>The IXV re-entry system is a technology platform to verify in-flight the performance of critical re-entry technologies when integrated at the system level. It is launched by Vega from the French spaceport in Guyana (CSG) and, following a first ballistic phase at around 420 Km altitude, it's conceived to perform a suborbital flight and re-enter through the atmosphere experiencing the typical LEO re-entry thermal loads, while performing a certain number of experiments related to TPS, AED, ATD and GNC, and validating engineering approach, margin policy and tools used to design and develop the demonstrator and to plan the mission.</p> <p>The IXV peculiar shape is a lifting body class and allows an increased inflight manoeuvrability favouring the suitable environment for critical technologies experimentation, like aerodynamics/aerothermodynamics, guidance, navigation, control, thermal protection materials and in flight measurements.</p> <p>After a successful System Qualification and acceptance review completed in early October 2014, the IXV demonstrator started its launch campaign in CSG and, after a first delay due to fulfilment of launcher trajectory safety aspects, a successful launch occurred on February 11th, 2015, following a perfectly nominal re-entry mission.</p> <p>The complete IXV system, both the flight and the ground station segments, demonstrated a perfect capability to withstand the challenging re-entry environment and to acquire the complete flight data as defined among the mission objectives.</p> <p>The elaboration of the huge mission data available will allow to better understand the behaviour of TPS materials together with thermal, aerodynamic, and GNC aspects in the challenge mission of the atmospheric re-entry.</p>