

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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EXPERT: THE ESA EXPERIMENTAL RE-ENTRY TEST-BED

**Abstract**

EXPERT is developed by the European Space Agency in order to provide high quality data on the critical aero-thermodynamic phenomena encountered during hypersonic flights, as well as to provide to European industry with system experience of re-entry vehicle design and manufacturing.

EXPERT will be launched from the Pacific Ocean into a sub-orbital trajectory by the Volna Russian launch system. After a ballistic flight, it will land safely on the Kamchatka peninsula by means of parachutes integrated in the descent and landing system. It will then be recovered and the acquired data will be used for post-flight analysis of the re-entry phenomena. The launch is planned in August 2011.

The EXPERT vehicle is equipped with 15 experiments provided by several scientific institutions all around Europe. The collected flight results will benefit all atmospheric re-entry activities ranging from future human and cargo orbital transportation systems to re-usable launch stages and scientific probes.

This paper describes the system overview and scientific objectives, as well as the main challenges found during the design, manufacturing and system integration activities. It includes detailed results of the system verification and vehicle acceptance testing, including details of the tests campaign performed for the more relevant subsystems and experiments.

The highlights of the EXPERT flight will be described and the preliminary mission results will be presented.