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SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2.)
Studies and Technologies for advanced Space Transportation Concepts (10.)

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TECHNOLOGY NEEDS OF EMERGING SPACE COMPANIES: THERMAL PROTECTION SYSTEMS

Abstract

Emerging Space Companies continue to make important advances in space transportation and space development. Witness the recent unveiling of Space-Ship-Two for carrying commercial passengers on suborbital flights, discussions between Bigelow Aerospace and Lockheed Martin on human rating of Atlas-V's for supplying passengers and logistics to a planned Bigelow Space Complex, and the fan fare with the Google Lunar-X prize announcement. With these new developments come new challenges and key among them is access to technology, expertise and facilities to accomplish these aggressive plans and goals, particularly where the needed capabilities reside within the government which is often the case. A particular case in point is thermal protection systems that comprise a key system for any for any crewed capability, as well as a number of robotic space activities. This paper reviews and summaries technology needs of the emerging space industry from the authors extensive interactions and activities supporting emerging space companies the last several years, with a particular focus on thermal protection systems. Currently available thermal protection systems are then reviewed and critiqued relative to the summarized needs, and several advancements that would be especially useful to emerging space companies are proposed.