

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch services, Missions, Operations and Facilities (2)

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PAYLOAD LAUNCH ENVIRONMENT ENVELOPES AND SPACE SYSTEMS INTEROPERABILITY

Abstract

As the world becomes increasingly globalized, launch vehicles and infrastructures remain remarkably balkanized. The major space-faring nations launch the vast majority of their own government's payloads on their own rockets. In addition, major satellite companies rarely switch launch providers in the middle of a satellite series. While this lock-in is in no small part driven by issues of national security and national prestige, it is exacerbated by the variation in launch adapters and environments on current launch vehicles, which increases the cost of technical interoperability. This technical hurdle need not exist, however, and there has been increasing interest in closing this gap, as seen recently in the promulgation of an international spacecraft docking standard.

In order to further pursue the development of global standards for interoperability, this paper surveys the operating environments of current and recent launch vehicles and the requirements of recent space systems. Areas examined will include physical interface dimensions, vibration loads, temperature loads, power interfaces, and safety requirements. In determining the range of various launch environment parameters, it will be possible to establish universal objective and threshold launch environment requirements for future launch vehicles and payloads and identify opportunities for further interoperability.