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Safe Transportation Systems for Sustainable Commercial Human Spaceflight / Small Launchers: Concepts
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A 2018 VIEW OF THE IMPENDING SMALL LAUNCH VEHICLE BOOM

Abstract

Small vehicle "Launch Fever" has reached an all time high. In 2015 we first presented this survey, and we identified twenty small launch vehicles under development. By the end of 2017 three new vehicles in this class were operational, 35 were identified under development, and a staggering 30 more were potential new entrants. Some are spurred by renewed government investment in space, such as what we see in the U.K. Others are new commercial entries from unexpected markets such as China. All are inspired by the success of SpaceX and the rapid proliferation of CubeSats and other small satellites. In this paper we present an overview of the small launch vehicles under development today. When available, we compare their capabilities, stated mission goals, cost and funding sources, and their publicized testing progress. We also review a number of entrants that have dropped out since we first started this report. With potentially three or more systems going operational in 2018, this could be a watershed year for small launch capability.

In order to present the most unbiased, and neutral data to our audience, we purposely avoid making any judgements on vehicle maturity or business case realism. However, with over 75 potential vehicles in various stages of conception or development, a number of specific trends in performance, cost, and technologies can be identified. Finally we attempt to answer the question of the validity of small vehicle development, when established players such as SpaceX and ULA believe that the continued growth area is for larger, not smaller vehicles.