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SMALL SATELLITE LAUNCH OPPORTUNITIES: STATISTICAL ANALYSIS AND TREND
FORECAST**Abstract**

In the last two decades, the boom of small satellites has been witnessed throughout the world; meanwhile, they have become more and more capable, even as competitive as large counterparts. This is because the concepts of miniaturisation, modularity, and commercialisation has lowered threshold of space mission design, especially for small satellites, which stimulates the market demands for small satellite launch opportunities.

However, the current satellite launch opportunities are limited and the corresponding launch costs are usually rather high. Although small satellites can be launched as secondary or piggyback payloads, such cooperation has not regularly appeared due to the lack of information, perception or experience. Moreover, it is not easy to make the decision when facing multiple launch options, for the reason that difficulties exist in reaching the compromise among the user operational intent, industry technical options and project financial budget.

On the demand aspect, developing an approach to discover an appropriate launch opportunity for given small satellite mission is imperative; on the supply aspect, launch access providers opt for holding market demand, forecasting future dynamic to realize rationalisation of industry and technology. This paper focuses on the statistical analysis and trend forecast of small satellite launch opportunities both on its demand and supply sides to provide an overall understanding of potential market demands.

By looking up the historical cases, a survey on existing and potential small satellite launch vehicles is carried out. The data processing and analysis are dual: on the micro level, different key user-defined objectives of classified launch vehicle, e.g., orbit altitude, payload capacity, and payload mass, are taken into consideration to make a comprehensive assessment on their launch capabilities; on the macro level, the statistical characteristics of different types of space missions, are estimated to generate a characteristic summary of current launch cases and trend forecast of future launch opportunities.

In conclusion, such a statistical analysis not only benefits the small satellites launch opportunity providers in the perspective of offering more market demanding, economical and competitive options,

but also deepens the knowledge and understanding of space system designers on small satellite launch opportunities.