

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Launch Vehicles in Service or in Development (1)

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THE OVERALL SCHEME OF SOLID LAUNCH VEHICLES SUITABLE FOR LAND AND SEA  
LAUNCH AND ITS LIFT CAPACITY ANALYSIS

**Abstract**

As an important part of China Space Transportation System, solid-propellant launch vehicles have a series of characteristics, such as the whole rocket storage, the universal use on sea and land, and the rapid response etc. They have been widely favoured in the military, civilian and commercial use. The paper summarizes the development and trend of solid launch vehicles inside and outside the country, and introduces the progress realized by China's solid launch vehicles at sea in detail. The paper also introduces a solid launch vehicle under research and development, which would be suitable for the both land and sea launch. In this paper, the model of three-degree-of-freedom trajectory calculation and optimization will be established and by the means of simulation, it will be analysed how the thrust-to-weight ratio, the structural coefficient of each sub-stage and the final stage's charge would impact on the rocket's lift capacity. It intends to provide a basis for the configuration selection and overall program demonstration of future solid-propellant rockets.