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Author: Dr. Xiaowei WANG

China Academy of Launch Vehicle Technology (CALT), China, wangxwbuaa@163.com

Mr. Taishan WANG

China aerospace science & industry corporation, China, 13466369591@139.com

Ms. DONG Xiaolin

China Academy of Launch Vehicle Technology(CALT), China, dongyinxiaolin@163.com

Prof. Lin Shen

China Academy of Launch Vehicle Technology (CALT), China, tolinsh@sina.com

AERIAL RECOVERY TECHNOLOGY OF LAUNCH VEHICLE

Abstract

Reusability is one of the development trends of launch vehicle, while the stage recovery technology should be conquered firstly. To study new launch vehicle stage recovery technology, the study focuses on the aerial recovery technology. The demand of launch vehicle aerial recovery is given firstly in this paper, and then the state-of-art of aerial recovery technology is summarized, and a typical aerial recovery of the first stage engine stage of a LOX/Methane launcher in China is designed. At last, the corresponding key technologies of aerial recovery are presented, including reenter deployable aerodynamic deceleration technology, helicopter aerial retrieval technology, intelligent hooking system design technology and reentry vehicle separation technology. And the solutions of the key technologies are given in this paper. A full-scale hooking system is designed and tested successfully. The results indicate that as a new stage recovery method, the aerial recovery has many advantages compared to propulsion-landing and sea-landing recoveries, including non-damage, precision, fast and flexibility. And it has significant value and application prospect, and the solutions of key technologies are identified, the flight test is being considered as soon as possible.