

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Solutions for Human Flights in China (9-D6.2)

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PROGRESS AND PROSPECT OF ADVANCED GUIDANCE AND CONTROL TECHNOLOGY FOR
LAUNCH VEHICLE

Abstract

As a branch of engineering dealing with the design of systems to control the movement of vehicles, especially, automobiles, ships, aircraft, and spacecraft Guidance, navigation and control (abbreviated GNC, GNC, or GC) is leading an more and more important role during our times. In aerospace fields GNC is a critical factor for successful mission achievement, especially for Saturn V, ISS and other big projects. Since the 21st century, facing the new challenge in the aerospace defense, the deep space exploration and etc, GNC is developing toward the low cost, high reliability and automatic ability. In 2002, NASA proposed the SLI plan, the advanced GNC technology obtain the extensive research in view of the aerospace vehicle, RLV along with the development of computer hardware and optimal control theory level. Along with the retirement of space shuttle, the ISS maintenance, moon exploration, Mars exploration and other duty under the demands, the heavy lift launch vehicle becomes one solution for successful duty implementation. As a result of the multiplicity and complexity of the mission, it urgently needs the flight control system to have a stronger reliability and task compatibility in GNC technology. The development situation of advanced GNC technology to current launch vehicle has been carried on brief showing in this article. The current advanced GNC technology as well as its key technologies is analyzed in this paper. Afterward, in view of the development situation of current HLLV, the related technology of flight control system is explained in this paper, and a preliminary forecast to the development of future GNC of launch vehicle is made.