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RESEARCH OF JOINT LAUNCH VEHICLE AND SATELLITE ADAPTIVE CODING TECHNOLOGY

Abstract

With the deepening of understanding of the flight status of launch vehicles, it is necessary to increase high-frequency and low-frequency test points on the rocket to verify the correctness of new understanding of the environment on the rocket during flight. However, current rocket telemetry technology is limited by channel capacity, which greatly restricts the amount of telemetry data. Taking the construction of satellite constellations as an opportunity, this article proposes a joint launch vehicle and satellite adaptive coding technology. The launch vehicle is based on the satellite reverse link to obtain the current status of the satellite-rocket channel and satellite network communication capacity. Combined with the demand for image, telemetry parameters, and other data in the current flight profile, based on the statistical characteristics of historical tasks, a matching criterion for the source code and channel code is established. Through a genetic algorithm based joint coding algorithm for the source channel, the current best performing source channel code is adaptively searched, and the image The telemetry data is encoded using this codeword and sent to the satellite end. Compared with traditional telemetry techniques, the joint source channel coding method proposed in this paper has better performance gains compared to the commonly used fixed code word coding methods.