

Variant of Technical Realization of Non-Linear Multiplexing GLONASS FDMA and CDMA Navigation Signals

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Abstract. Due to modernization of the GLONASS system, a problem of non-linear multiplexing of GLONASS FDMA and CDMA navigation signals has become of interest. The multiplexing allows transmitting these signals through a common space vehicle (SV) antenna. Development of an apparatus for generating composite (group) L1 and L2 signals each formed by non-linear multiplexing of GLONASS FDMA and CDMA navigation signals may reduce mass-dimensional characteristics of SV. However, the difficulty of such multiplexing is that clock frequencies and central frequencies of the multiplexed GLONASS navigation signals have an unacceptably great value of lowest common multiple, as opposed to the value for known methods of non-linear multiplexing, such as AltBOC modulation.

The article proposes an algorithm for computing model values of a composite signal. The algorithm considerably simplifies technical realization of the non-linear multiplexer (NMUX) to form GLONASS signals.

A method of computing energy loss is proposed. Spectrum of a composite signal in radio astronomy band is estimated.

Keywords: global navigation satellite system (GNSS), GLONASS, non-linear multiplexing, energy loss, AltBOC