

Estimation of Permissible Time Lag to Update Signal Propagation Delay between Antennas of Digital Antenna Fields

S. I. Vatutin, *Cand. Sci. (Engineering)*, vatutin.si@spacecorp.ru
Joint Stock Company "Russian Space Systems", Moscow, Russian Federation

Abstract. For several relatively small-scale aperture antennas aggregation into the single digital antenna array (digital antenna field) with the spacecraft telemeter signal receiving total area there was suggested previously an individual antennas signals synchronous addition method, when antennas are mutually spaced by the enough big distance in order not to shade one another. A base idea of this method is compensation of signal mutual delays between antennas by appropriate shifting the different antennas signals sampling pulses.

The wave propagation delay between antennas update in compliance with spacecraft motion values must enter regularly in realizing suggested method device registers. In this article, the estimation of wave propagation delay update permissible time lag between the digital antenna fields antennas in sampling pulse delay unit registers was performed. It is shown that even when operate with most dynamic spacecrafts on reference orbit wave propagation delay update permissible time lag between digital antenna fields antennas is not critical for implementation practically ideal digital antenna array antennas signals synchronous addition.

Keywords: antenna array, receiver, signals synchronous addition, intermediate frequency, path difference, propagation delay, update