Sampling Theorem and Practical Usage of Entire Functions for Signal Representation on the Receiving Side

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Abstract. The article contains the provisions uniting engineering and mathematical approaches to process telemetry signals and other information signals on the reception side. The connection between a tabular composition of the values of telemetric parameters and the functions simulating these parameters is shown. The method to evaluate the nature of the change of different types of telemetry parameters is described. A number of the tasks, the solution of which will make possible to apply the mathematical apparatus of Kotel'nikov for economical coding of information as an effective alternative to the methods used today, is offered.

The pay-offs of the paper consist in clearly set of engineering tasks, innovative approaches to processing and representation of the space telemetry. In conjunction with application of modern mathematical methods of data transformation, the presented provisions allow realization of the development of essentially new methods of information transfer.

Keywords: sampling theorem, continuous function, telemetry signal, spectral form, cutoff frequency, reading, sampling, sampling rate, time axis, approximating polynomial, orthogonal basis