Holographic Implementation of a Linear Predictor of Random Processes: Influence of High-pass and Low-pass Filtering on the Process Characteristics[*]

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Abstract

Task of prediction is actual for telecommunication networks due to the increasing of the traffic. Linear predictor can be applied for the task solving as traffic in the networks is described by the model of Fractal Brownian Motion. However, the model is computationally expensive and the predictor has to operate in real time. Optics allows to solve these problems. Also, optical predictor can be linked with other optical devices – cables, routers and switchers.

The predictor was implemented experimentally by optical (holographic) technique[1,2]. In this report we demonstrate how to meet the conditions of the model (zero mean, stationarity) by using filtering in the Fourier space, which appears as a result of limited dynamical range of the recording medium.

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