Molecular Communication Noise Effect Analysis of Diffusion-Based Channel for Considering Minimum-Shift Keying and Molecular Shift Keying Modulations

Authors : A. Azari, S. S. K. Seyyedi

Abstract : One of the unaddressed and open challenges in the nano-networking is the characteristics of noise. The previous analysis, however, has concentrated on end-to-end communication model with no separate modelings for propagation channel and noise. By considering a separate signal propagation and noise model, the design and implementation of an optimum receiver will be much easier. In this paper, we justify consideration of a separate additive Gaussian noise model of a nano-communication system based on the molecular communication channel for which are applicable for MSK and MOSK modulation schemes. The presented noise analysis is based on the Brownian motion process, and advection molecular statistics, where the received random signal has a probability density function whose mean is equal to the mean number of the received molecules. Finally, the justification of received signal magnitude being uncorrelated with additive non-stationary white noise is provided.