Theory of Protection of Nano-Telecommunication Communications in Emergency Situations (Noise or Random Oscillation)

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- **Abstract:**

- Note : Noise is a low-frequency random oscillation that occurs in many nanocommunication devices, including nanoelectronics, the environment, and organisms. Noise can obscure signals, so it is often omitted from electronic and radio transmissions.

- **Keywords:** Communications , Noise is a low-frequency , Electromagnetic waves , Noise

Introduction

The origin of noise in nanoelectronics is currently mostly in carbon nanotubes based on the nanocommunicative functions and the structure of graphene particles in nanotubes in interaction for nanocommunication purposes by (nanoparticles) in single-walled carbon nanotubes (CNTs) and multi-walled CNTs. Nanomaterials with high surface-to-volume ratio are very attractive for noise generated by nanoelectrons because they are very sensitive to changes in their surface. A representative material of this type is carbon nanotubes, which are rolled sheets of hexagonal graphene lattice, which are only one carbon atom thick. Simple nanocommunication devices consist of a carbon nanotube that forms two electrodes. These magnetic communication particles are exposed to different large molecules, causing some of them to bind to the surface of the carbon nanotube. In nanocommunications, different molecules give off unique acoustic signals related to the properties of the molecules. The strength of the interaction between the carbon nanotubes and the molecules arises from the noise signals. In nanocommunicators interacting with carbon nanotube-based electronic nanoparticles, the signal generated by the carbon nanotube device is modified following the absorption of specific single molecules. This is because the absorbing molecule creates a trap state in the carbon nanotube, which causes it to conduct. This means that carbon nanotube-based nanocommunicators are very sensitive. They can detect an unprecedented amount of single molecules. The ability to characterize single molecules using highly sensitive nanoelectronics is an exciting prospect in the field of sensors, especially for neural and biosensor applications. The use of acoustic signals to detect molecular activity ((interaction) or (active orbital)) is attractive. In nanocommunicators and interacting with carbon nanotube-based electronic nanoparticles, the sensitivity of signal detection may be increased by the generation of controllable noise. These carbon nanotube-based nanocommunicators demonstrate that it is possible to detect single molecules through their unique noise particles in current nanocommunicator signals. Improved knowledge about the molecular origin and interaction of noise with carbon nanotube-based electronic nanoparticles should lead to the development of electronics that use noise to improve their performance rather than degrade it.

Origin of Noise in Carbon Nanotubes Based on Nano-Telecommunication Functions

The source of noise in nanoelectronics is currently mostly in carbon nanotubes based on the nano-communication functions and structure of graphene particles present in nanotubes interacting for nano-communication purposes by (nanoparticles) present in single-walled carbon nanotubes (CNTs) and multi-walled CNTs.Nanomaterials with high surface-to-volume ratios are very attractive because the noise generated by nanoelectrons is very sensitive to changes in their surface. A representative material of this type is carbon nanotubes, which are rolled sheets of a hexagonal lattice of graphene that are only one carbon atom thick.Simple nanocommunication devices consist of a carbon nanotube that forms two electrodes. These magnetic communication particles are exposed to various large molecules, causing some of them to bind to the surface of the carbon nanotube. In nanocommunications, different molecules give off unique acoustic signals related to the properties of the molecules. The strength of the interaction between the carbon nanotubes and the molecules is derived from the noise signals. In nanocommunications, the interaction of electronic nanoparticles with carbon nanotubes changes the signal produced by the carbon nanotube device following the absorption of specific single molecules. This is because the absorbing molecule creates a trap state in the carbon nanotube, which causes it to conduct. This means that carbon nanotube-based nanocommunications devices are very sensitive. They can detect an unprecedented amount of single molecules. The ability to characterize single molecules using highly sensitive nanoelectronics is an exciting prospect in the field of sensors, especially for neuroscience and biosensor applications. The use of acoustic signals to detect molecular activity ((interaction) or (active orbital)) is attractive. In nanocommunicators and nanoparticle-based electronic interactions based on carbon nanotubes, the sensitivity of signal detection may be increased by the generation of controllable noise. These nanocommunicator devices based on carbon nanotubes demonstrate the possibility of identifying individual molecules through their unique noise particles in current nanocommunicator signals. Improved knowledge of the molecular origin and nanoparticle-based electronic interactions based on carbon nanotubes noise should lead to the development of electronics that use noise to improve their performance rather than degrade it.

Nano-Telecommunication Modulation (RN and TN) Nano-Wave Receiver and Transmitter

The TN nanotransmitter and RN electromagnetic receiver must be able to perform operations such as baseband processing , frequency conversion, filtering, and amplification of the signals it sends or those that reach the nanoantenna from free space. Given that the nanoantenna will oscillate at terahertz frequencies, it is necessary to use FET RF transistors that are capable of operating at this high frequency . Several transistors have been developed and introduced in this field. At lower frequencies, nanodevices are able to communicate over longer distances, but the efficiency of nanodevices is expected to be very low in this case. Therefore, nanosensors do not communicate at MHz frequencies, and higher energy waves are required to control a large number of nanodevices over a very wide area. For this reason, nanodevices communicate at frequencies of about 1.0 to 10 terahertz. Due to the severe limitations of nanodevices in terms of size and energy, the generation of high-power signals at terahertz frequencies is not practical. Therefore, classical communication patterns based on continuous signal communication cannot be implemented and for WNSNs, short-pulse modulation techniques in the time domain (OOK-TS: Keying Off-On) are used. These techniques are used especially in cases such as extracorporeal disease diagnosis systems and targeted drug delivery in the body as well as the nano-Internet of Things. Waves as information carriers are similar to classical communications. However, due to the severe shortage of resources and quantum effects of materials, classical methods cannot be directly applied in the nano-domain. Hence, it is necessary to use new materials and techniques.

Nano Telecom RX Receiver and TX Transmitter

Data transfer between nanosensors can increase the capabilities and applications of nanodevices compared to their standalone operation in both complexity and range of functionality. The electromagnetic transceiver must be able to perform operations such as performing baseband processing , frequency conversion, filtering, and amplification of waves for the signals it sends or those that reach the nanoantenna from free space. (There are four major strategies for communicating between nanodevices : acoustic, nanomechanical, molecular, and electromagnetic) Molecular communication involves sending and receiving information encoded in molecules , while electromagnetic communication involves sending and receiving electromagnetic radiation from various nanodevices.Of these methods, molecular communication and electromagnetic communication are considered wireless methods.In the electromagnetic communication method, electromagnetic communication between nanosensors depends on the development and construction of two important parts, the nanoantenna and its associated transceiver. Since the nanoantenna will oscillate at terahertz frequencies, it is necessary to use FET RF transistors that are capable of operating at this high frequency. At lower frequencies, nanodevices are capable of communicating over longer distances, but the efficiency of nanodevices is expected to be very low in this case. Therefore, nanosensors do not communicate at megahertz frequencies, and higher energy waves are required to control a large number of nanodevices over a very wide area. Thus, The reason is that nanodevices communicate at frequencies of about 1.0 to 10 terahertz. Due to the severe limitations of nanodevices in terms of size and energy, the generation of high-power signals at terahertz frequencies is not practical. Therefore, classical communication patterns based on continuous signal communication cannot be implemented, and for WNSNs, short-pulse modulation techniques in the time domain (OOK-TS: Keying Off-On) are used. Regarding the processors of nanosensors, it should be emphasized that the physical limitations of nanosensors can lead to limitations in the complexity of the processes that can be performed in them. On the other hand, their speed is not limited in this regard. In addition, another important issue that needs to be considered for development is new communication protocols and modulations. Given the low processing power available in nanosensors, these communication techniques must be simplified and the capabilities of nanostructures can be maximized.

How noise and interference work on nanocommunication and environmental waves

Radio waves can be charged differently, electronic signals can carry any type of charge that can be moved through the air through radio waves and used for different purposes. There is no harmless parasitic waves and they are basically used to upset the balance and as long as they are spread, they sit on any conductor, including the human body, water and creatures and react. The waves do not stay only at a certain distance and can be repeated several times and spread over long distances when they collide with mountains, water, buildings, roofs, mirrors, vehicles, etc.

Dealing with noise and interference with AWGN and BSC channels in telecommunications, digital waves, and radar

An algorithm based on entropy theory is designed and proposed that is capable of detecting block and convolutional coding types. Simulation results of the proposed algorithm show that this algorithm is capable of detecting the coding type in AWGN channels .) with minimum signal-to-noise ratio 3dBBinary Symmetric Channel (BSC)) with a probability of error of less than 0.1 and binary channel with clearing (BEC)) with a probability of error of less than 0.2 It is.

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