

An Approach of Node Model TCnNet: Trellis Coded Nanonetworks on Graphene Composite Substrate

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Abstract : Nanotechnology opens the door to new paradigms that introduces a variety of novel tools enabling a plethora of potential applications in the biomedical, industrial, environmental, and military fields. This work proposes an integrated node model by applying the same concepts of TCNet to networks of nanodevices where the nodes are cooperatively interconnected with a low-complexity Mealy Machine (MM) topology integrating in the same electronic system the modules necessary for independent operation in wireless sensor networks (WSNs), consisting of Rectennas (RF to DC power converters), Code Generators based on Finite State Machine (FSM) & Trellis Decoder and On-chip Transmit/Receive with autonomy in terms of energy sources applying the Energy Harvesting technique. This approach considers the use of a Graphene Composite Substrate (GCS) for the integrated electronic circuits meeting the following characteristics: mechanical flexibility, miniaturization, and optical transparency, besides being ecological. In addition, graphene consists of a layer of carbon atoms with the configuration of a honeycomb crystal lattice, which has attracted the attention of the scientific community due to its unique Electrical Characteristics.

Keywords : composite substrate, energy harvesting, finite state machine, graphene, nanotechnology, rectennas, wireless sensor networks

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