ЗБОРНИК АПСТРАКТА И ПРОГРАМ

65. КОНФЕРЕНЦИЈЕ ЕТРАН и 8. КОНФЕРЕНЦИЈЕ ИцЕТРАН

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8th Conference IcETRAN in conjunction with the 65th ETRAN Conference

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Електроника
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NMI1.3 BIOMOLECULES AND BROWNIAN MOTION

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Structures and different life functions of microorganisms, like motion, are based on molecular biology processes, which comprise molecular and submolecular particles. It is very important to determine relation between molecular and microorganisms levels. The aim of our research is the analysis of Brownian motion as a general phenomenon and the consequence of structures hierarchy from molecular to microorganisms level. If we approach this idea from the aspect of biomimetic correlations at the level of the alive and nonalive matter system particles, the condensed matter particles could be considered as a part of micro, nano and molecular microorganisms structures. In this research we used the experimental results of bacterial motion influenced by different energy impulses. The important goal of this research paper is to obtain significant data regarding Brownian motion in the frame of fractal nature similarities, as an integrative property of living and nonliving systems particles processes. This opens new frontiers for submicroelectronics relations within the integrated supermicro biophysical systems. This is a potential new trend in nowadays advanced research, where we integrate the knowledges of complex relations between the electrons or other particles and their clusters as joint structures in alive and condensed matter, what could be a possible direction for new microelectronics complex biodevices and integrations.

NMI1.4 RECONSTRUCTION OF FIBER REINFORCEMENT IN EPOXY-BASED COMPOSITE

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Polymer matrix composites (PMCs) are very attractive materials due to a possibility to achieve versatile properties by combining with ceramic or metal reinforcement in different shapes and sizes. As a result, PMCs have found application in nearly every field, from household appliances to aerospace industry. Modern microelectronic devices contain conductive polymers with fillers that enhance their electrical properties. In addition, PMCs are being used as insulators and adhesives, contributing to the long life of electronic devices. Epoxy resins are the most commonly used insulators and adhesives. In order to improve their fracture toughness, glass fibers can be used as an efficient reinforcement. However, with the purpose of designing a composite with good mechanical properties and durability, deep knowledge of microstructure is required. In addition, microstructural analysis can be used to connect shape and size of pores or reinforcement with various physical properties. Fractal nature analysis is a valuable mathematical tool that can be employed for different shapes and forms rendering. In this manner, successful design and prediction of composite's properties could be obtained. In this research, field emission scanning electron microscopy (FESEM) images were used for fractal analysis of glass fibers, with the aim of reconstructing the shape.