Editorial

Low-Dimensional Semiconductor Structures for Optoelectronic Applications

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A truly extraordinary research effort is pressed to develop a full understanding of the properties of matters at the nanoscale and its possible applications. The aim of the special issue is to include the recent advances in new and original theoretical, experimental, and/or simulation works in narrow-gap, nanoscaled, and low-dimensional structures for infrared detectors, solar cells, and transistors.

Among a large number of submissions, we have selected 10 papers for publication in the special issue. The work reported by H. Cui et al. is believed to be very useful in measuring the minority carrier lifetime of HgCdTe photodetector by using optical and electrical methods. The paper by Y. Liu et al. reports an experimental work for determining temperature-dependent stress state in thin AlGaN layer of AlGaN/GaN HEMT heterostructures by near-resonant Raman scattering. The theoretical modeling is in good agreement with the measurements. M. J. Wang et al. and W. W. Wang et al. published two papers on InGaAs/GaAs quantum dot/quantum well infrared photodetector. Both papers are highly important for the design, fabrication, and characterization of quantum dot/quantum well infrared photodetectors. A two-dimensional simulation for effects of structure parameters on shot channel effects of low-dimensional nanoscaled inversion-mode InGaAs MOSFETs has been investigated in detail by C. H. Yu et al. The paper by

L. Li and D. Xiong reports a mathematical model for investigating photoresponse of long-wavelength AlGaAs/GaAs quantum cascade detectors. The theoretical results for simulating photoresponse of AlGaAs/GaAs detectors could be of immense importance for the designing of AlGaAs/GaAs-based optoelectronic devices. An interesting work on modeling and design of graphene GaAs junction solar cell reported by Y. Kuang et al. has also been considered for publication. D. Yin et al. report on synthesis, characterization, and photoluminescence on the glass doped with AgInS₂ nanocrystals. The paper by F. Liu et al. presents a detailed investigation on shell thickness-dependent strain distributions of confined Au/Ag and Ag/Au core-shell nanoparticles, providing an effective method to manipulate the strain distributions of the Au/Ag and Ag/Au nanoparticles by tuning the thickness of the shell. The paper by G. Shanmuganathan and I. B. S. Banu reports influence of codoping on the optical properties of ZnO thin films synthesized on glass substrate by chemical bath deposition method, confirming that codoped ZnO thin films can be suitable candidates for antireflecting coating and optoelectronic devices. It is believed that the special issue will be of significant interest to the scientists and researchers working in the areas related to the narrow-gap semiconductors and low-dimensional structures for optoelectronic applications.

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