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BRIEF DESCRIPTION OF THE UNIT / RESEARCH GROUP
Thermoelectric Energy Harvesting

The main research areas of the Integrated Electronics Department are focused on microelectronics circuits design and integrated circuits technology with focus on applications in wireless telecommunications systems, optoelectronics and functional electronics. The Department is well equipped by measurement instruments including probe stations, network and spectrum analyzers. An access to Atomic Layer Deposition reactor SUNALE R-150 allows the realization of a number of technological operations devoted to deposition of thin but very smooth films. The Institute of Physical Chemistry and Electrochemistry is well equipped with laboratories for the synthesis of a variety of thermoelectric materials combined with high-resolution structural characterization by scanning and transmission electron microscopy and x-ray diffraction. Semi-automatized measurement facilities allow to estimate relevant thermoelectric properties of materials and assembled devices.

The cooperation was finished in 2018.

WHAT WE OFFER / PROJECT DESCRIPTION

New thermoelectric materials and their integration into thermoelectric generator modules to transfer waste heat into useful electricity. Manufacturing of device prototypes and their evaluation by experiment combined with finite-element simulation. Development of low-power electronics and wire-less sensor nodes. Application of thermoelectric energy harvesting devices to aliment wire-less sensor networks for process monitoring.

KEYWORDS

Materials, Scanning electron microscopy, Transmission electron microscopy, X-ray diffraction, Seebeck coefficient, electric conductivity, thermal conductivity, modules, thermoelectric generator, low-power electronics, wire-less sensor nodes, waste heat recovery

COLLABORATIONS SOUGHT

Processes with large amount of waste heat to apply the thermoelectric generators