Quantitative scanning probe microscopy techniques for heat transfer management in nanomaterials and nanodevices: first advancements

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The development of increasingly complex and nanostructured materials and devices, for example thermoelectric materials, nanocomposite polymers or micro- and nanosystems (microelectronics systems, MEMS/NEMS), requires in many cases an accurate knowledge of the thermal properties of the materials at the nanoscale. Scanning Thermal Microscopy (SThM) is a key technique for such thermal measurements with a submicrometric spatial resolution [1].

The European project QUANTIHEAT "Quantitative scanning probe microscopy techniques for heat transfer management in nanomaterials and nanodevices" aims at solving the problems of thermal metrology at the nanoscale by delivering accurate and traceable metrology tools (nanoscale thermal terminologies, calibration samples and guidelines, modeling, novel SThM probes) for enabling the thermal management and advancing the development of new generation nanomaterials.

The purpose of this poster is to provide an overview of the results obtained during the first period of the project, especially those linked to the improvement of the understanding of heat transfer in SThM measurements and to the hierarchical design of reference experiments.

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Reference

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