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Funding decision

Name	Organisation	Project title	Decision No.	Decision date	Funding period	Funding
Toth, Geza	OY	Nanoscale thermal management of multi-scale electrical components using carbon nanotubes grown by CCVD and PECVD	128908	15.09.2008	01.01.2009 - 31.12.2011	195 450

Project description
The continuously increasing packing density of transistors and the corresponding problem of heat dissipation is a major problem in high performance IC technology. In classical cooling setups, heat-sinks/coolers are integrated on the hot surface or tiny flow channels are formed in the bulk of the component. We a claim to develop novel cooling methods and/or utilize new materials by which heat can be dissipated in a more efficient manner. the role of interfaces between carbon nanotubes and surfaces is essential. The overall objectives of the research are the study of phonon/heat transport through interfaces that multi-walled carbon nanotubes (MWCNTs) form with other materials. We design, and investigate novel approaches for thermal management in electronic devices. Large area cooling and microscopic hot spot removal with carbon nanotubes grown by catalytic chemical vapor deposition (CCVD) and also by plasma enhanced chemical vapor deposition (PECVD) techniques combined with lithography techniques will be applied to construct model structures for our experiments. We study how ballistic phonon transport and the accompanied high thermal conductivity in CNTs can be exploited when interfaces are involved. In co-operation with the World¿s leading American laboratories in this field, experimental; and in cooperation with one of Finland¿s most significant molecular dynamics (MD) research laboratory, theoretical work will be pursued towards realizing enhanced cooling on various electronic components.