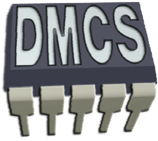

DMCS **REASON**

Tutorial

HALF DAY ON THERMAL ISSUES IN MICROELECTRONICS

25th June 2003, Lodz, Poland

The tutorial is planned to be associated with the 10th International Conference Mixed Design of Integrated Circuits and Systems – MIXDES, which will be held in Lodz on 26-28 of June 2003. The tutorial is a half-day event targeted at university teaching staff, PhD students and system design engineers. There are no special prerequisites, however some basic knowledge on the heat transfer would be helpful.

The tutorial is an international event open for everyone and the number of participants is not limited. The official language of the tutorial will be English. The tutorial will be free of charge for all the REASON partners, for other persons the fee is 10 €. The handouts will be distributed for the participants during the tutorial and afterwards they will be available to the project partners at the Reason Website.

PRELIMINARY TUTORIAL PROGRAMME

Part I

Inverse Heat Conduction Problems in Electronics

by Dr. Marcin Janicki from Technical University of Lodz, Poland

13:30 – 15:00

1. Fundamentals of heat transfer in solids:
   Heat equation. Solution methods.
2. Inverse heat conduction problems:
   Problem definition. Function and parameter estimation.
3. Methods of solving inverse problems:
   Regularization and function specification methods.
4. Practical examples of inverse problems in electronics:
   Material property estimation. Power and temperature estimation.

Part II

Advanced Thermal Design of Microelectronic Devices with Flip-Chip Bonded Dies

by Prof. Dmytro Fedasyuk from Lviv Polytechnic, Ukraine

15:00 – 16:30

1. Introduction:
   Characterization of flip-chip structures. Advantages and thermal problems.
2. Mathematical background of thermal analysis of flip-chip structure:
   Modeling of steady-state thermal fields. Transient thermal analysis of the flip-chip structures.
3. Modern tools for thermal simulation of the microelectronic devices with flip-chip bonded dies:
   Web-based thermal simulator for flip-chip structure WEBTAFC. CAD tools for the distributed thermal design of microelectronic system.
4. Application and results of thermal design.

16:30 – 17:00 Coffee Break

Part III

Measurement, modeling and simulation of thermal dynamics in microelectronic structures

by Prof. András Poppe from Budapest University of Technology and Economics, Hungary

17:00 – 18:30

1. Thermal transient testing: measurement methods and available tools. DCP measurements.
2. Evaluation of thermal transients (heating/cooling curves) by the NID method: time-constant spectra, structure functions, RC models derived from transient curves.
3. Structure functions as models of the physical structure. Using structure functions for heat-flow path reconstruction and for creating compact models for thermal simulation purposes
4. Creating compact models from thermal transient curves by optimization
5. Using dynamic compact models in thermal and electro-thermal simulation

Contact person:

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More news will be available soon at: http://www.mixdes.org/time.