

Workshop: Simulation of Power Electronic Systems with PLECS

Bologna – Monday, November 3, 2008

Speakers: Prof. Domenico Casadei, Head of the Electrical Eng. Dept., University of Bologna
Dr. Jost Allmeling, Plexim GmbH, Zurich

- Agenda:**
- 9:30 Introduction
 - 9:45 J. Allmeling: **Simulation of power electronic systems**
 - Challenges in numerical simulation of switching power systems
 - Different degrees of simulation detail
 - System (Simulink) versus circuit (Spice) simulation
 - Ideal/perfect switches
 - Variable versus fixed time step simulation
 - 10:30 *Coffee break*
 - 11:00 J. Allmeling: **How to use PLECS**
 - Demo: Simulation of a buck converter
 - Variable versus fixed time step simulation
 - Simulation of parasitic effects (diode reverse recovery)
 - Models of electrical machines
 - 11:30 J. Allmeling: **Thermal modeling concepts for system simulation**
 - Look-up tables for conduction and switching losses
 - Structure modeling and heat sink concept
 - Steady-state analysis
 - 12:00 D. Casadei: **Power electronics at the Department of Electrical Engineering, University of Bologna**
 - Current research projects
 - Power electronics in education
 - Need for simulation software
 - 12:30 *Lunch*
 - 14:00 J. Allmeling: **Circuit analysis tools**
 - AC sweep and loop-gain analysis
 - Fast small signal analysis
 - State-space averaging
 - 14:30 **Hands-on exercises with PLECS**
(Please bring your own laptop with MATLAB/Simulink installed)
 - Forward converter
 - Electrical drive system
 - Thermal simulation
 - 16:30 **Discussion and outlook**
 - 17:00 *End*

Venue: Università di Bologna, Facoltà di Ingegneria, Viale Risorgimento, 2 – Bologna, Italy
Aula Magna, 2nd floor

Delegate fee: free of charge

Registration: Ing. Luca Zarri, luca.zarri@mail.ing.unibo.it, www.die.unibo.it, +39 051 209 3572