

PLECS WORKSHOP

Three Day Advanced Workshop on Modeling and Simulation of Power Electronic Systems
Zurich, May 7 to 9, 2014

May 7	Day 1
10:00	Introduction to PLECS <ul style="list-style-type: none">▶ General use of PLECS Blockset and PLECS Standalone▶ Installation of the Software Exercise: Modeling a buck converter
12:00	Lunch
13:00	Numerical Simulation, Solver Settings <ul style="list-style-type: none">▶ Definition of stiff and non-stiff systems▶ Explicit and non-explicit solvers▶ Stability domains▶ Accuracy considerations, step size control▶ Proper handling of discontinuities, zero-crossing detection Exercise: Solver accuracy and settings
14:30	Break
15:00	Thermal Modeling <ul style="list-style-type: none">▶ Combined electrical-thermal simulation▶ Switching & conduction loss descriptions Exercise: Thermal modeling of a buck converter, advanced exercise on the thermal design of an inverter with PLECS
16.30	Magnetic Modeling <ul style="list-style-type: none">▶ Reluctance-resistance analogy approach▶ Permeance capacitance analogy model▶ Magnetic component library Exercise: Modeling a forward converter transformer using the magnetic domain
17.30	Aperitif at Plexim
19:00	Dinner

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May 8	Day 2
08:30	C-Code Integration <ul style="list-style-type: none">▶ Solver operation▶ Sample time settings▶ DLL Block Exercise: Efficient PWM generation using the PLECS C-Script block
10:00	Simulation Scripting <ul style="list-style-type: none">▶ Pre- and post-process simulation results▶ Automated simulations, parameter sweeps
10:15	Break
10:45	Analysis Tools <ul style="list-style-type: none">▶ Steady state analysis▶ AC sweep and impulse response analysis Exercise: Control design of a flyback converter using PLECS
12:00	Lunch
13:00	System Design Exercise of a Phase-shift Converter <ul style="list-style-type: none">▶ Overall parameter definition▶ Magnetic design and optimization
14:30	Break
15:00	System Design Exercise of a Phase-shift Converter (Continued) <ul style="list-style-type: none">▶ Thermal design▶ Control design
17:30	End of Day 2

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May 9	Day 3
08:30	Mechanical Domain and Electrical Machine Modeling <ul style="list-style-type: none">▶ Simulation of electromechanical systems▶ Inelastic collisions▶ Electrical machine models and implementations in PLECS Exercise: Modeling an electric vehicle using the PLECS mechanical domain
10:30	Break
11:00	Processor in the Loop Simulation (PIL) <ul style="list-style-type: none">▶ Control code evaluation▶ One code approach▶ Task scheduling Code Generation <ul style="list-style-type: none">▶ Basic ideas▶ Code generation for the electrical circuit and control loop▶ Limitations PLECS Web-based Simulation <ul style="list-style-type: none">▶ Introduction and demonstration▶ Existing examples
12:30	Lunch
13:30	Q&A Outlook for new features
15:00	End of the Workshop
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Venue	Plexim GmbH, Conference Room Basic 2nd Floor, Technoparkstrasse 1, 8005 Zürich, Switzerland