

# PLECS WORKSHOP

Advanced Modeling and Simulation of Power Electronic Systems  
Università di Parma March 27th, 2025

08:30	Registration
09:00	<b>Introduction to PLECS</b> <ul style="list-style-type: none"><li>▶ General use of PLECS Blockset and PLECS Standalone</li><li>▶ Instantaneous switching</li><li>▶ Variable and fixed-step operation</li></ul> Exercise: Modeling a switched-mode power supply
10:30	Break
11:00	<b>Solver Settings</b> <ul style="list-style-type: none"><li>▶ Definition of stiff and non-stiff systems</li><li>▶ Explicit and non-explicit solvers</li><li>▶ Stability domains</li><li>▶ Accuracy considerations, step size control</li><li>▶ Proper handling of discontinuities, zero-crossing detection</li></ul>
12:00	Lunch
13:00	<b>Introduction to Thermal Simulation</b> <ul style="list-style-type: none"><li>▶ Switching &amp; conduction loss descriptions</li><li>▶ Combined electrical-thermal simulation</li><li>▶ Determining loss values from data sheets</li></ul> Exercise: Thermal modeling of a buck converter
14:30	Break
15:00	<b>Overview of PLECS Tools</b> <ul style="list-style-type: none"><li>▶ Custom components</li><li>▶ Steady-state and small-signal analysis</li><li>▶ State machine, simulation scripting, C-Script, and the DLL block</li></ul>
15:30	<b>HIL Testbench Demonstration</b> <ul style="list-style-type: none"><li>▶ Automatic code generation for microcontrollers</li><li>▶ Plant code generation for the RT Box</li><li>▶ Running simulations on the CPU and FPGA</li></ul>
16:00	Q&A
16:15	End of day
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