

PLECS WORKSHOP

Advanced Modeling and Simulation of Power Electronic Systems
The University of Nottingham, April 18, 2023

08:30	Registration
09:00	Introduction to PLECS <ul style="list-style-type: none">▶ General use of PLECS Blockset and PLECS Standalone▶ Instantaneous switching▶ Variable and fixed-step operation Exercise: Modeling a switched-mode power supply
10:00	Break
10:30	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
12:00	Lunch
13:00	Introduction to Thermal, Magnetic & Mechanic Modeling & Simulation <ul style="list-style-type: none">▶ Switching & conduction loss descriptions▶ Combined electrical-thermal simulation▶ Permeance Capacitance Analogy Model Exercise: Thermal modeling of a buck converter
14:30	Break
15:00	Overview of PLECS Tools <ul style="list-style-type: none">▶ Custom components▶ Steady State analysis▶ Small signal analysis▶ State machine, C-Script and the DLL block▶ Simulation scripting Exercise: Building a modulator using the state machine block
16:00	Overview and Introduction to the PLECS RT Box <ul style="list-style-type: none">▶ Hardware-in-the-Loop (HIL)▶ Rapid control prototyping (RCP)▶ Demonstration of a real-time simulation
16:30	End of day
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