

# Caspoc

Fast and Easy Power Electronics and Electrical Drives Simulation

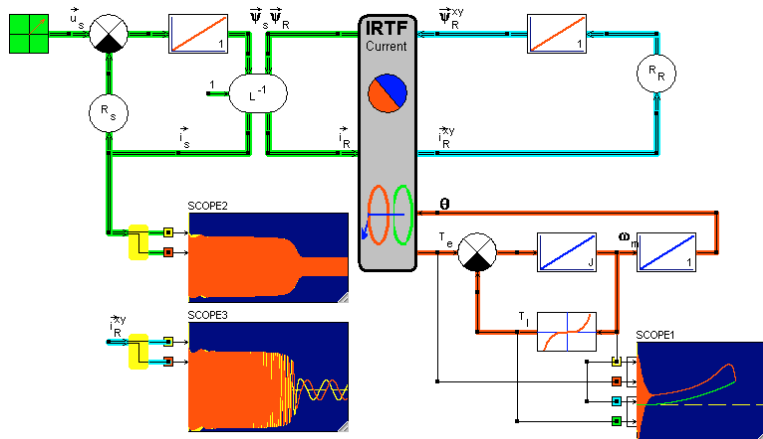
## Electrical Drives Library for Hybrid Electric Vehicles

The *Advanced Electrical Drives* library is especially developed for the design of nowadays traction drives for Hybrid and Electric Vehicles.

*Complete drive train simulation for Hybrid Electric Vehicles! Include the combustion engine, wheels, clutch, differential, electric motor, generator, inverter, battery, bi-directional-converter in one model. Simulate entire drive cycles and observe the power management in the drive train.*

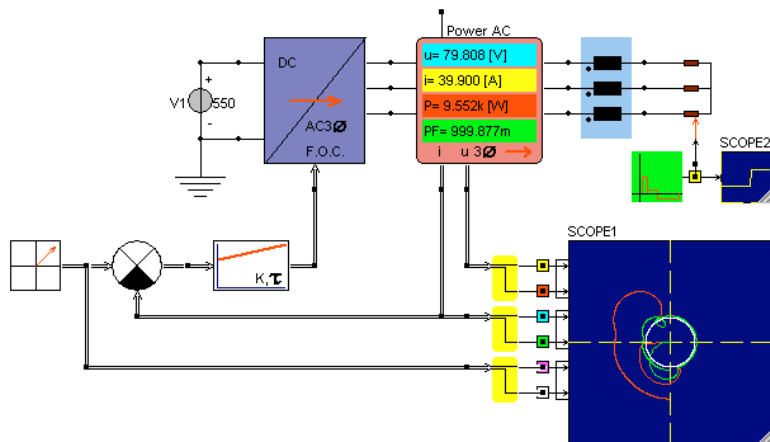
### Detailed machine modeling using the IRTF models

Induction machine model with non-linear mechanical load.



### PI control of voltage source inverter

The simulation below shows an ideal three phase inverter with PI control. The currents in the load circuitry are measured and transformed into a two-phase system. The PI controller is modeled using the space vector components.



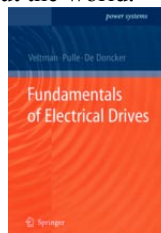
*Summarizing;  
detailed drive control modeling with non-linear  
Space-Vector components  
quick and easy.*

### Features:

- DC machine; series, parallel, shunt and permanent magnet
- Brushless DC
- Permanent Magnet Synchronous Machines, PMSM, Surface mount and Interior permanent magnet motors
- Induction machines; squirrel cage and wound rotor, wye/delta connection
- Switched Reluctance Machines
- Single Phase actuators
- Synchronous Machines, externally excited
- PI controllers with feed forward for servo control
- Field weakening, MTPA and MFPA
- Modulation; Pulse Width Modulation (PWM), Space Vector Modulation (SVM), Centerline, Continuous and Discontinuous
- Deadtime compensation
- Park and Clark transformations
- Vector Control blocks
- Sensorless control blocks
- Mosfet inverters with Space Vector Modulation (SVM)
- IGBT inverters with Space Vector Modulation (SVM)
- Mosfet inverters with Space Vector Modulation (SVM) and thermal model
- IGBT inverters with Space Vector Modulation (SVM) and thermal model
- IGBT six-pack inverter with thermal model and temperature dependency of the IGBT's
- Mechanical models for wheels, shaft, inertia, gearbox, backlash, clutch, brake, stick-slip

### In depth literature on drives with many Caspoc Tutorials

*Fundamentals of Electrical Drives* and *Advanced Electrical Drives* is for readers with a basic engineering knowledge who have a need or desire to comprehend and apply the theory and simulation methods which are applied by drive specialist throughout the world.



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