



# Power System Design with Ansoft EM Tool Suite

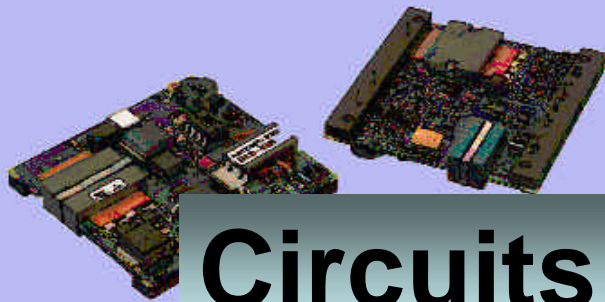
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**automotive  
engineering**  
INTERNATIONAL



**Circuits**



DC **MOSFET**

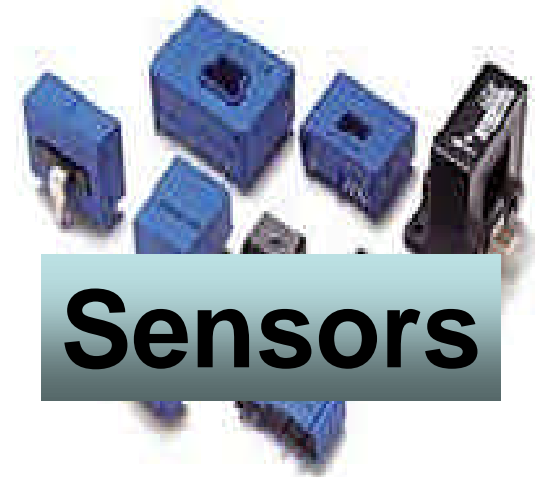


**Transformer**

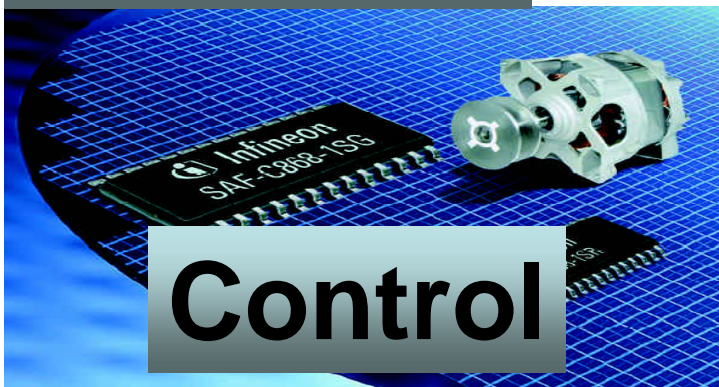


**Power Converter**

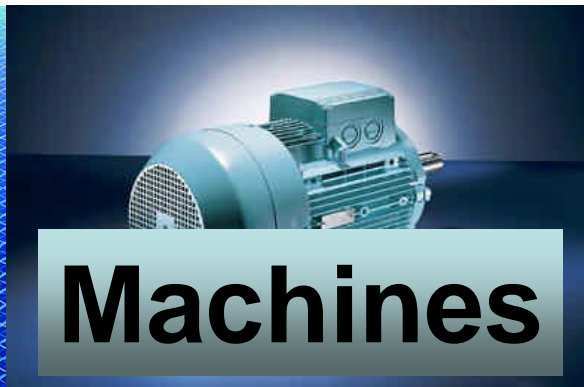
# Multi Domain Design



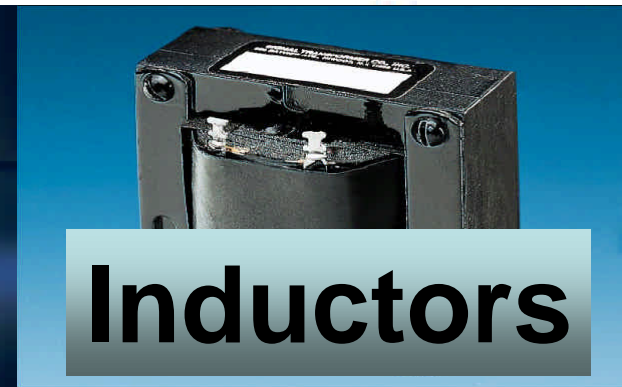
**Sensors**



**Control**



**Machines**



**Inductors**

# The Challenge

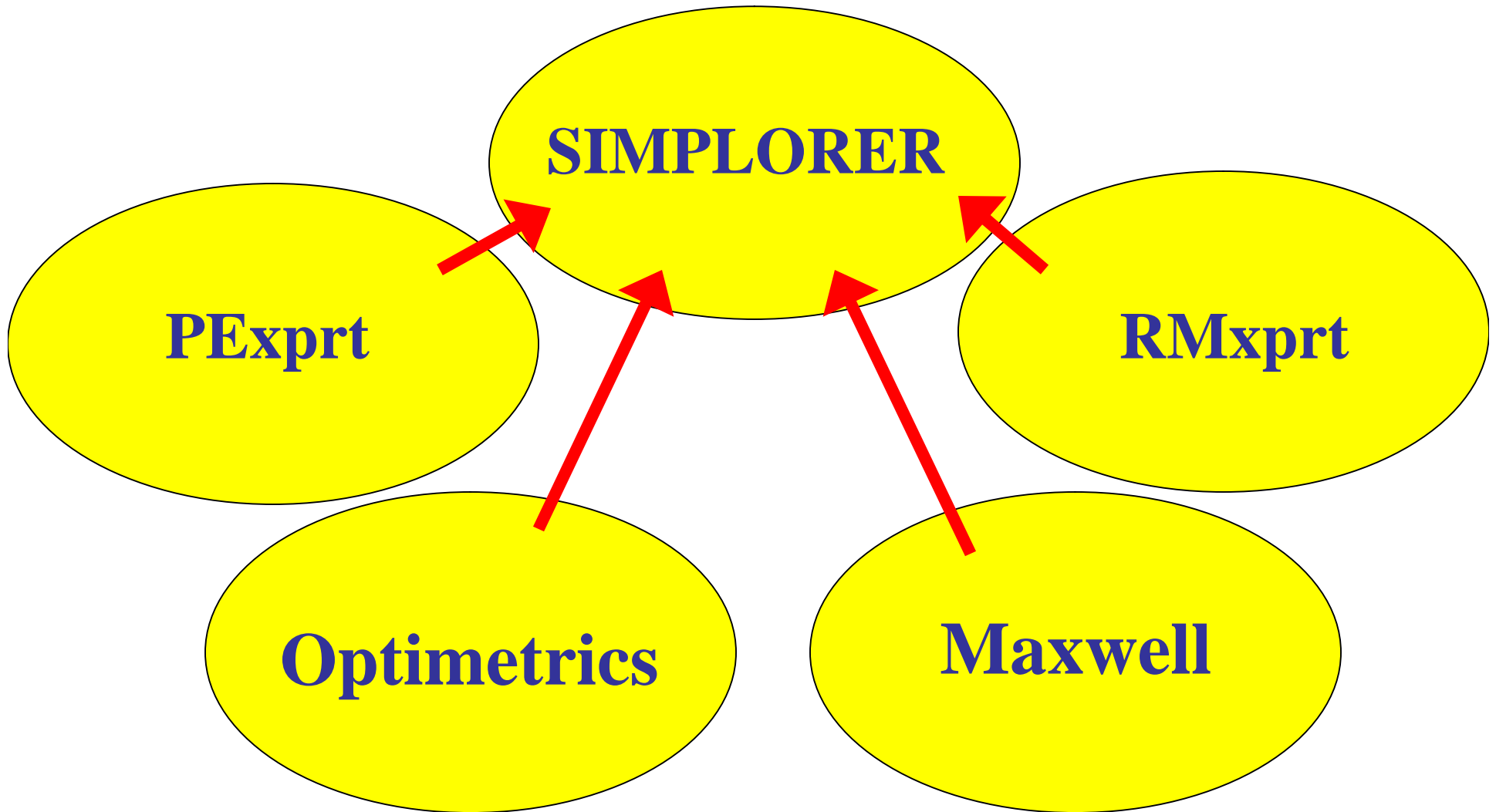
Predicting the performance of the system in advance of building a prototype is needed to maintain a competitive advantage



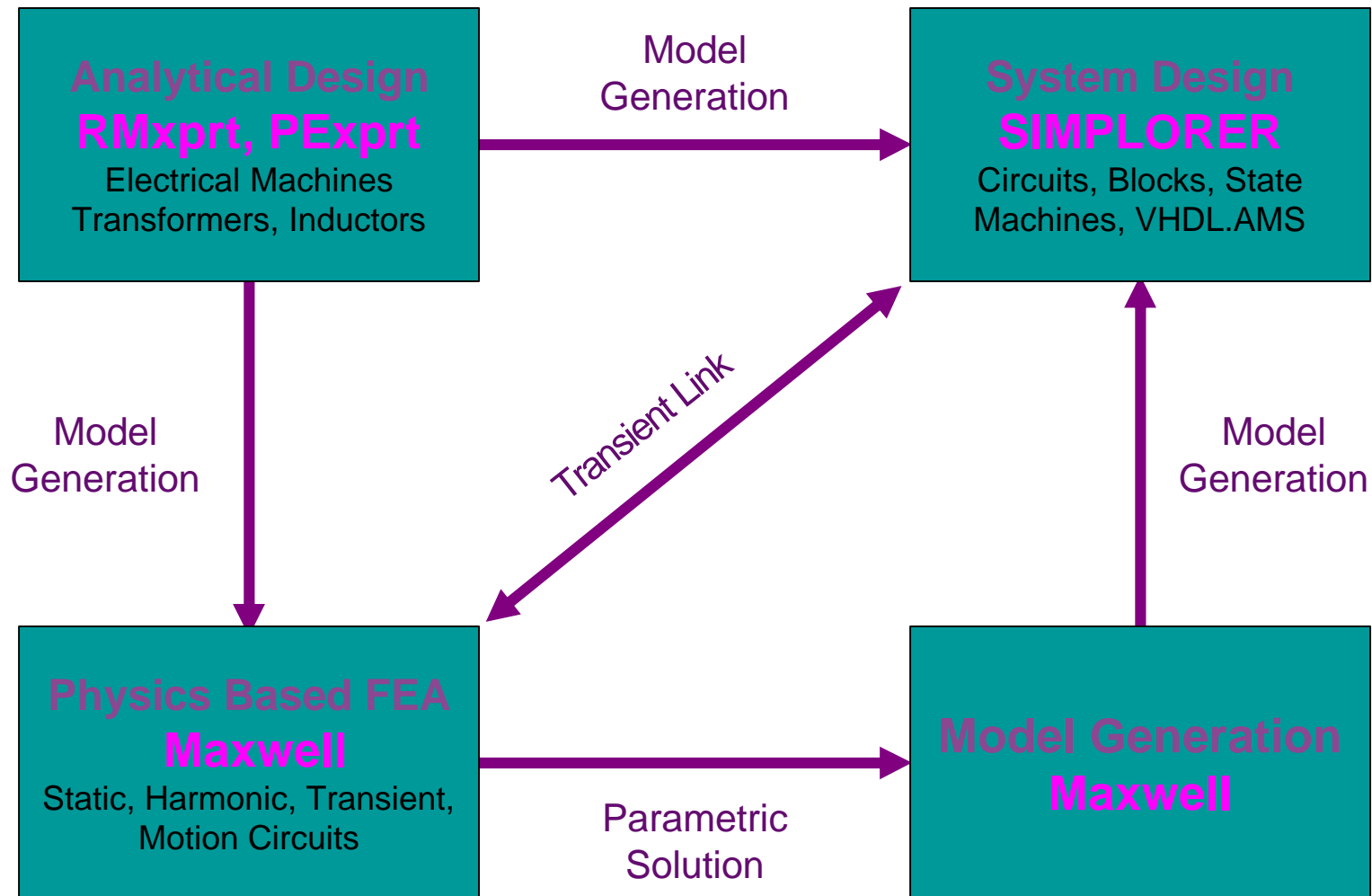
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AUTOMOTIVE ELECTROMECHANICAL  
SIMULATION **WORKSHOP** 2004

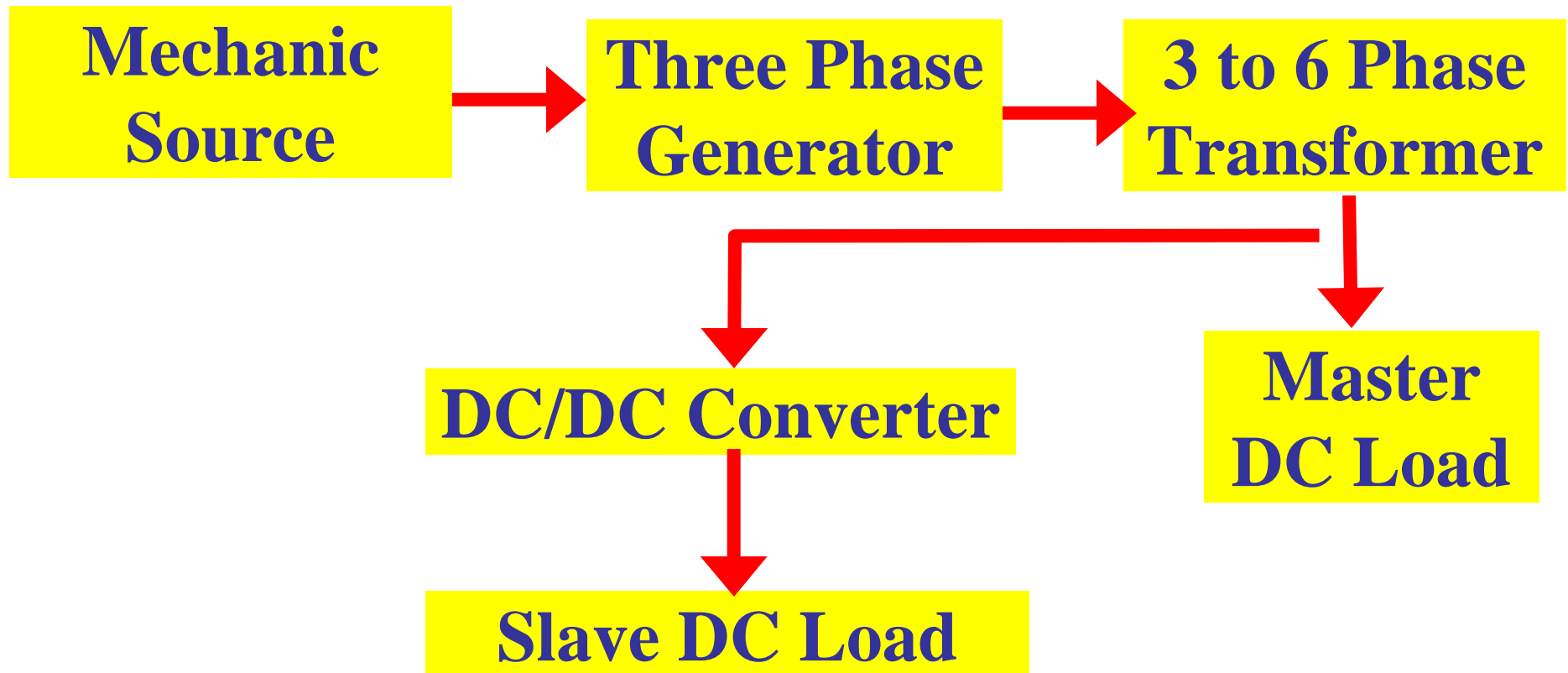
# Ansoft Tool Suite



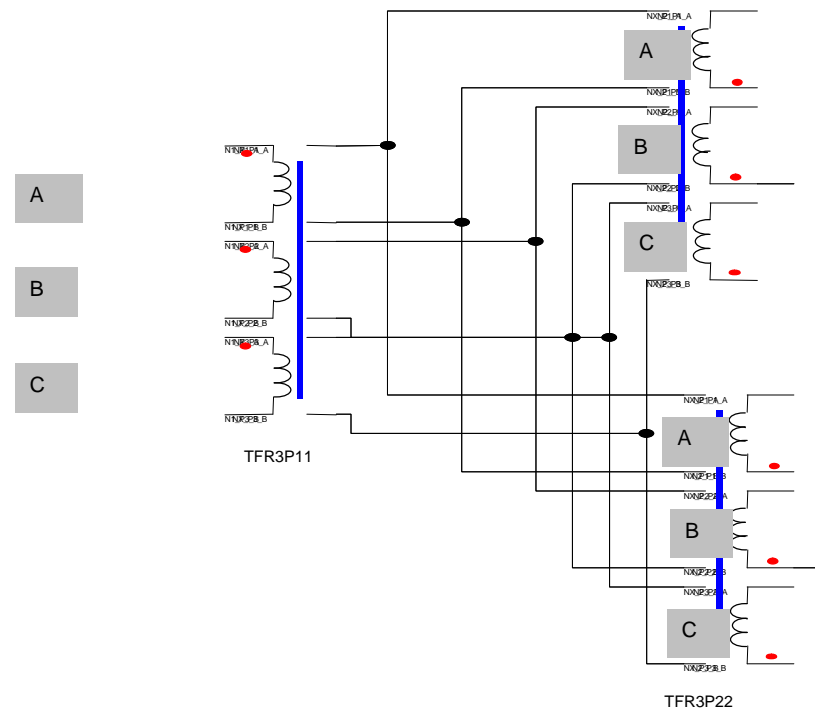
# Integrated Design Flow



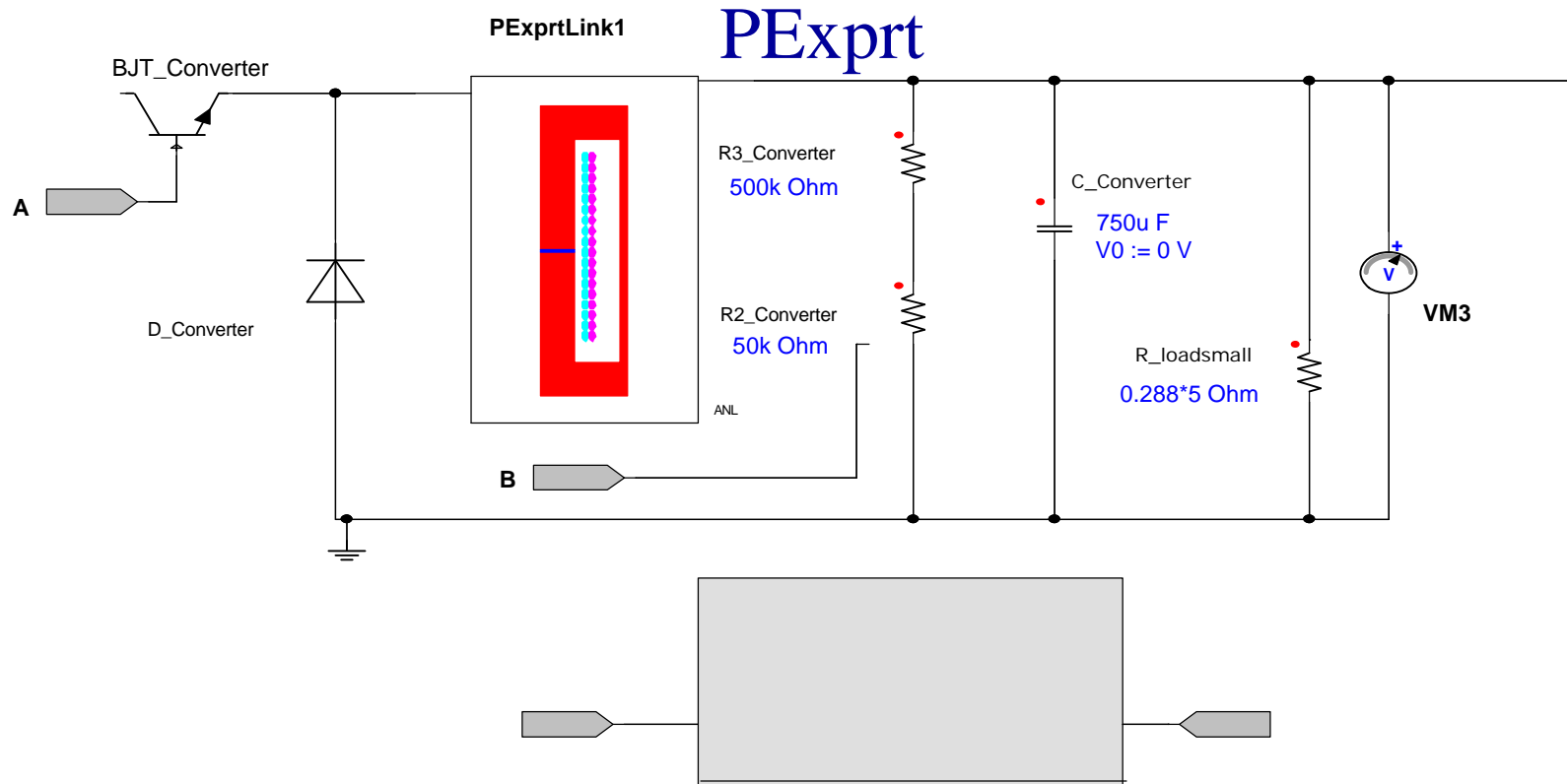
# The Power System structure



# Three Phase to Six Phase Transformer

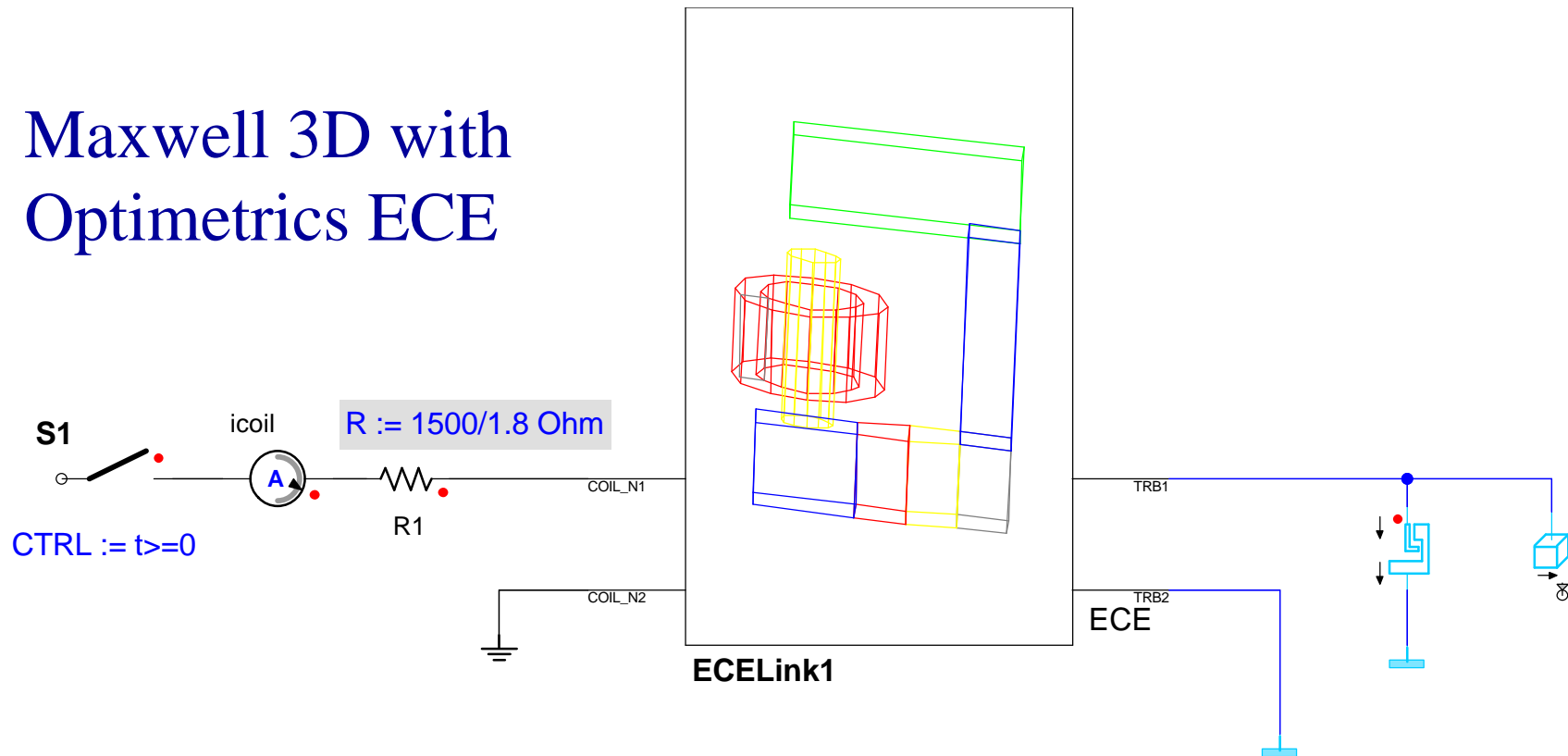


# DC/DC Converter to Power Slave Load

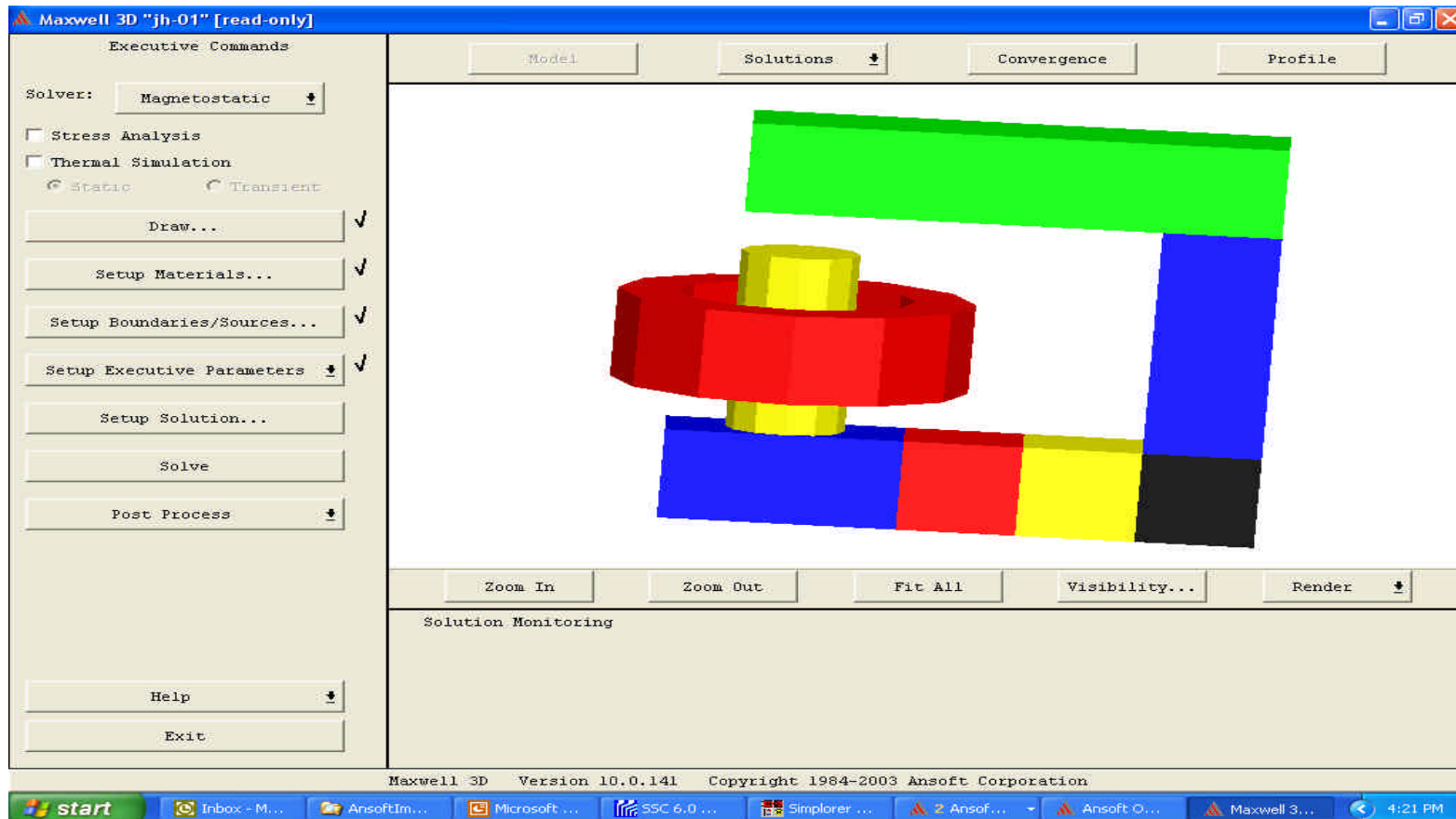


# Actuator to Switch on Control System

Maxwell 3D with  
Optimetrics ECE



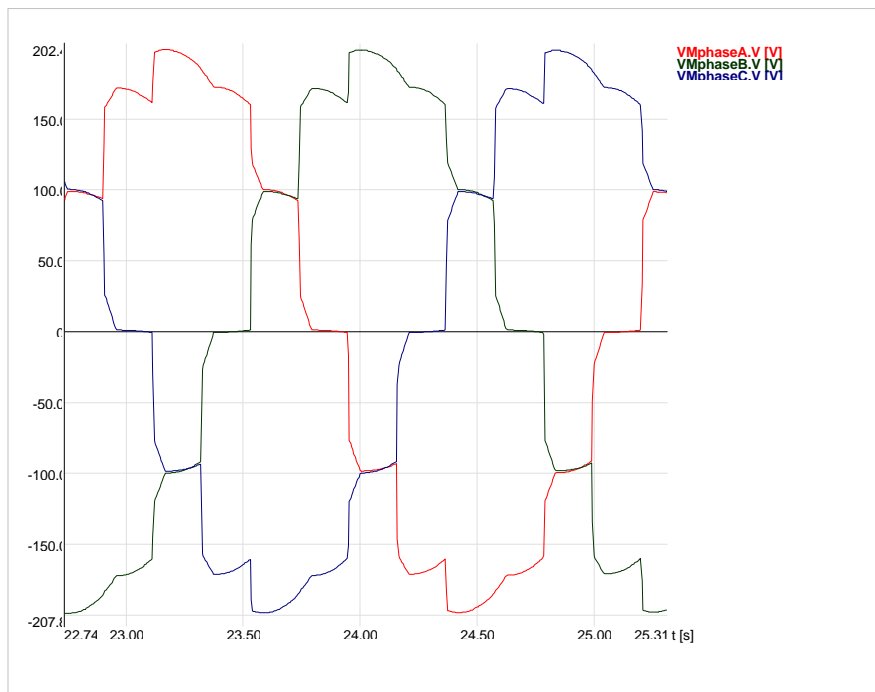
# Actuator – Component Level Model



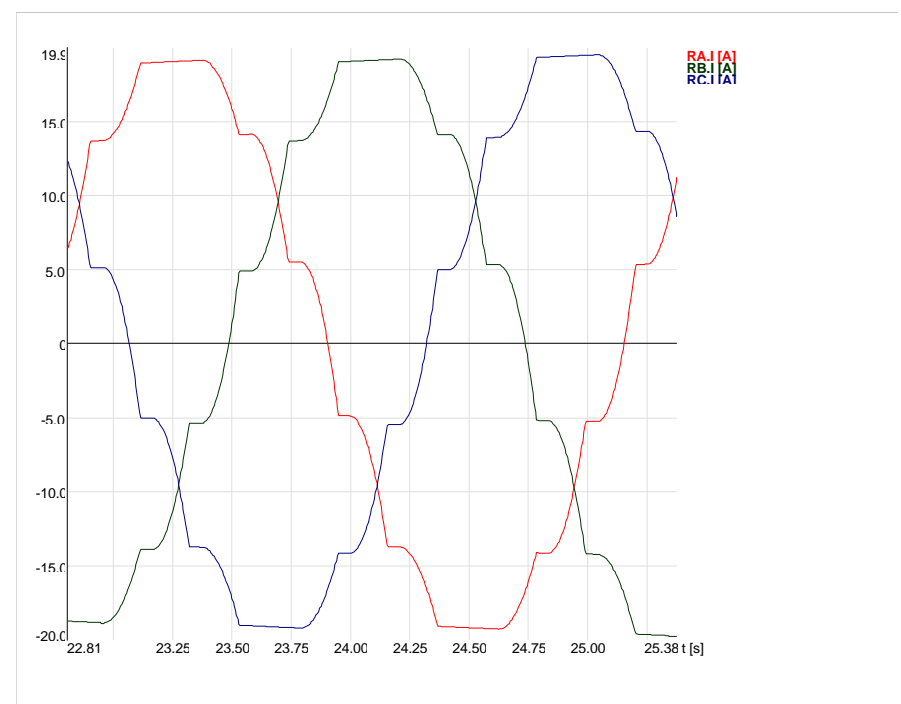


# Complete System Simulation

## Generator Voltage

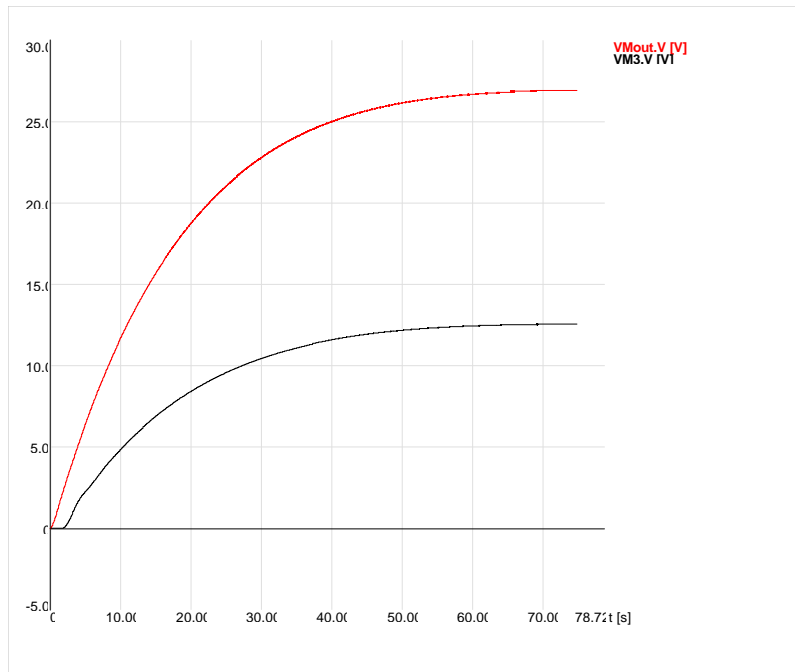


## Generator Current

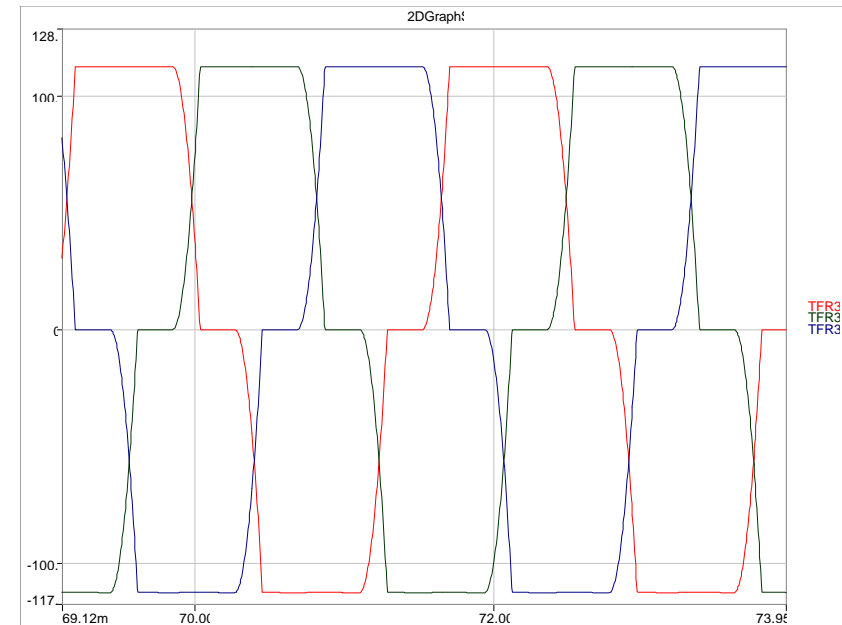


# Complete System Simulation

## DC Input / Output

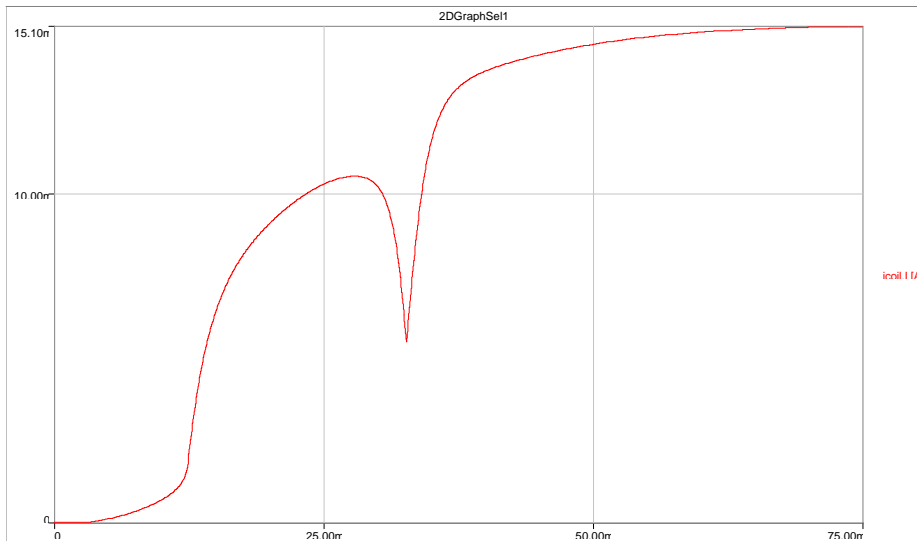


## Transformer Current

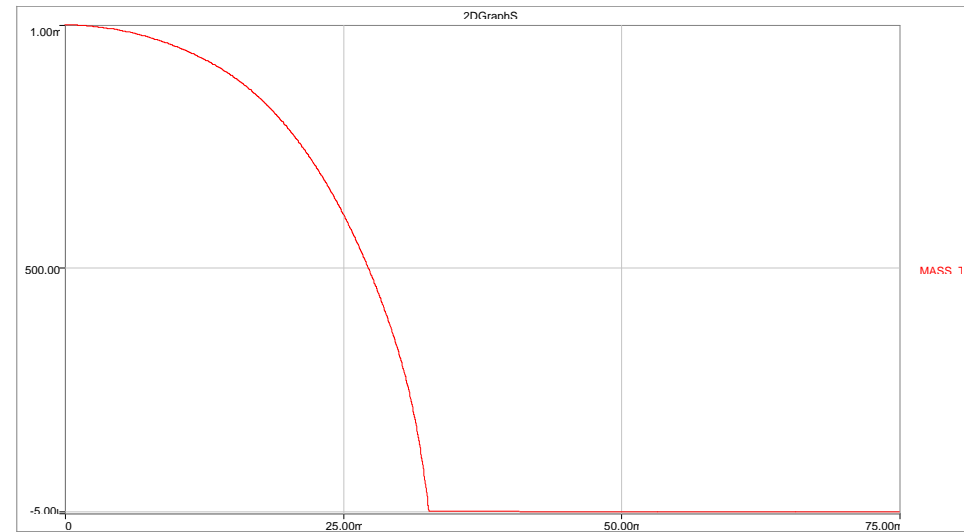


# Complete System Simulation

## Actuator Current



## Actuator Position



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SIMULATION **WORKSHOP 2004**