

Numerical Methods in Electro-Mechanics

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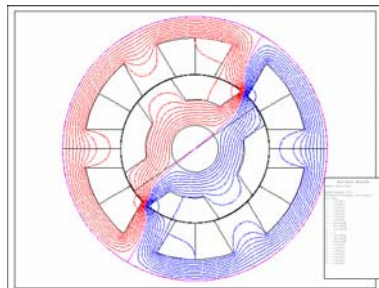
Electromagnetics Group

Develop Finite Element, Boundary Element and Analytical Expressions for Design and Analysis of Electromechanical Devices

Support: GE, KAPL, ONR, ABB, Curtis-Wright, Electric Boat

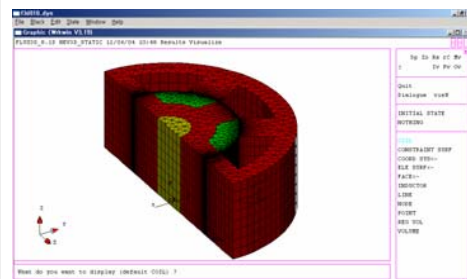
1

Switched Reluctance Motor for Hybrid Electric Vehicle



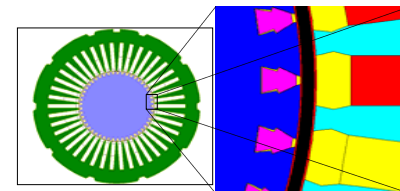
2

3D Model of SRM for Hybrid Electric Vehicle



3

Canned Induction Motor Analysis

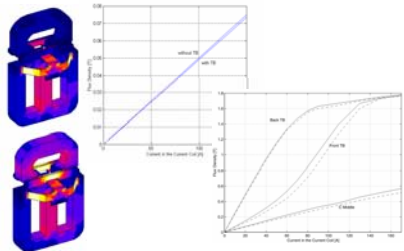


Stator and Rotor are enclosed in metal cans
Rotor body is solid rather than laminated

4

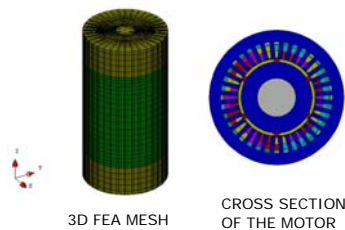
ABB Watt-Hour Meter Electromechanical Analysis

Magnetostatic Analysis of Watt-hour Meter



5

3D Model of BLDC Motor

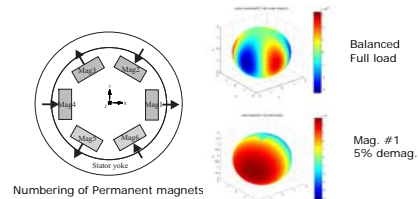


3D FEA MESH

CROSS SECTION OF THE MOTOR

6

Multipole Decomposition of Magnetic Signature



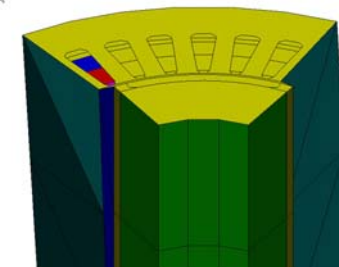
Balanced Full load

Mag. #1 5% demag.

Numbering of Permanent magnets

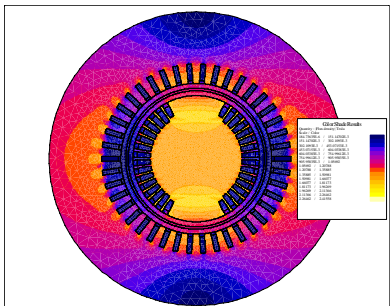
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3D Model for Cogging Torque Analysis



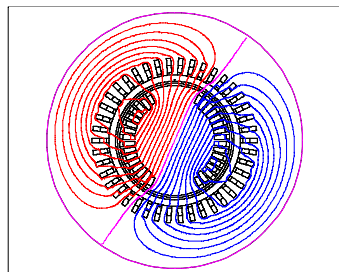
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GE Field Ground Sensor Study No Load



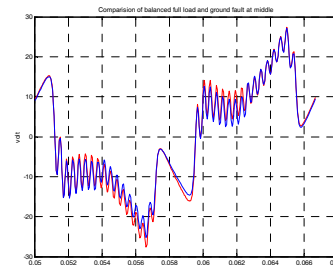
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Generator at Full Load



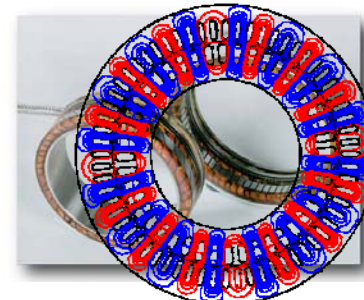
10

Sensor Reading (blue - faulted case, red - normal case)



11

Resolver



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