

# AC Magnetic Analysis

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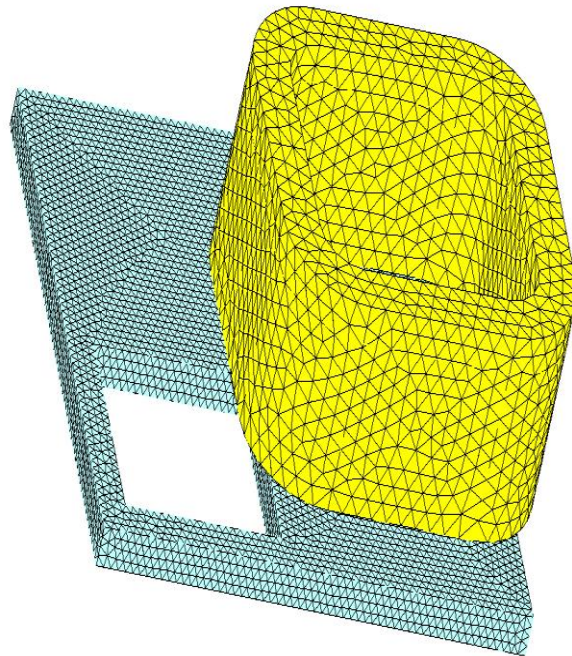
## 1. Introduction

The model consists of a thick aluminum plate with an eccentric hole and an exciting coil. The entire structure will be modeled since it is asymmetrical

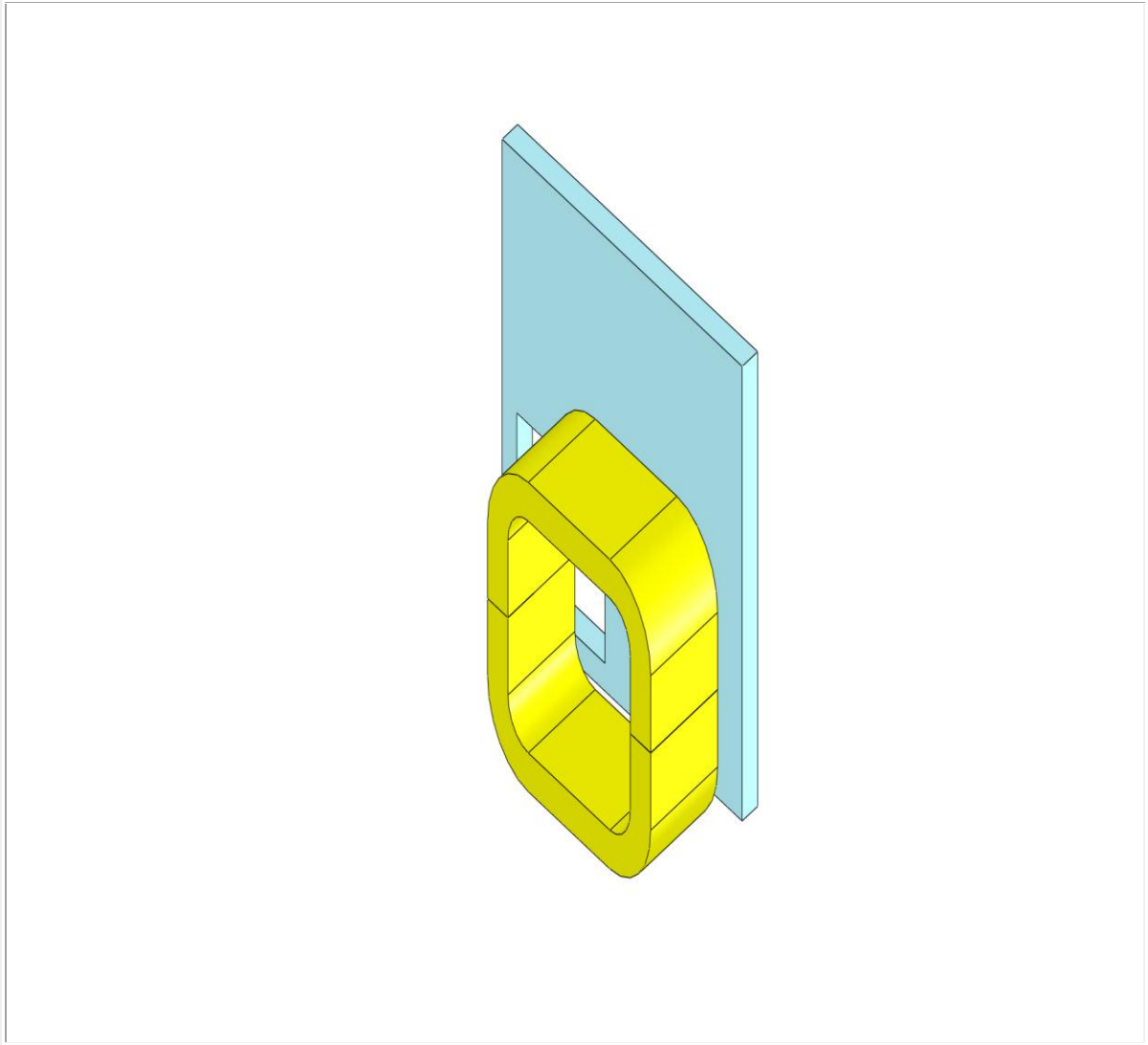
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## 2. Model View

**Team Problem 7\_Current View (Mesh)**



**Team Problem 7\_Isometric View**



### 3. Materials

Note: R.P. stands for Relative Permeability

Nbr.	Part Name	Material Name	Permeability Type
1	Airb-1-Body 1 (Extrude1)	<a href="#">Air</a>	Isotropic
2	Half Coil1-1-Body 1 (Extrude1)	<a href="#">Copper</a>	Isotropic
3	Half Coil1-2-Body 1 (Extrude1)	<a href="#">Copper</a>	Isotropic
4	Hole1-1-Body 1 (Extrude1)	<a href="#">Air</a>	Isotropic
5	Outer Air-1-Body 1 (Cavity1)	<a href="#">Air</a>	Isotropic
6	Plate-1-Body 1 (Cavity1)	<a href="#">AluminiumForAC</a>	Isotropic

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## 4. Coils Information

Coils

Nb r.	Name	Nbr.Of Turns	Magnitude	Phase	Components & Bodies
1	Wound Coil - 1	100	1.944681e+001	0.0000e+000 deg	Half Coil1-1 Half Coil1-2

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## 5. Study Properties

Mesh Information

Nbr.Of Nodes	Nbr.Of Elements	Element Size (m)	Tolerance (m)
62338	372342	0.100000	0.000100

Mesh Controls information

Nb r.	Name	Mesh Size	Size Unit	Components & Bodies	Selected Faces
1	MeshControl - 1	5.000000	mm	Plate-1	
2	MeshControl - 2	10.000000	mm	Half Coil1-1 Half Coil1-2 Airb-1 Hole1-1	

### Solver information

<b>Frequency (Hz)</b>	<b>Compute Circuit Parameters</b>
5.000000e+001	Yes

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## 6. Results Table

### Inductance Results (H)

<b>Coil Name</b>	<b>Wound Coil - 1</b>
Wound Coil - 1	1.600453e-003

### Flux Linkage Results

<b>Coil Name</b>	<b>Flux Linkage (Wb)</b>
Wound Coil - 1	0.000000e+000

### Current Results

<b>Coil Name</b>	<b>Current (A)</b>
Wound Coil - 1	( 1.944681e+001 , 0.000000e+000 )

### Impedance Results (Ohms)

<b>Coil Name</b>	<b>Wound Coil - 1</b>
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Wound Coil - 1	( 1.709192e+000 , 5.027970e-001 )
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### Voltage Results

Coil Name	Voltage (V)
Wound Coil - 1	( 3.312650e+001 , 9.654744e+000 )

### Losses Density Results

Solid Bodies	Ohmic Loss (W)
Half Coil1-1 - Body 1 (Extrude1)	8.406522e+000
Plate-1 - Body 1 (Cavity1)	4.338992e+000
Half Coil1-2 - Body 1 (Extrude1)	8.404570e+000

### Energy Results

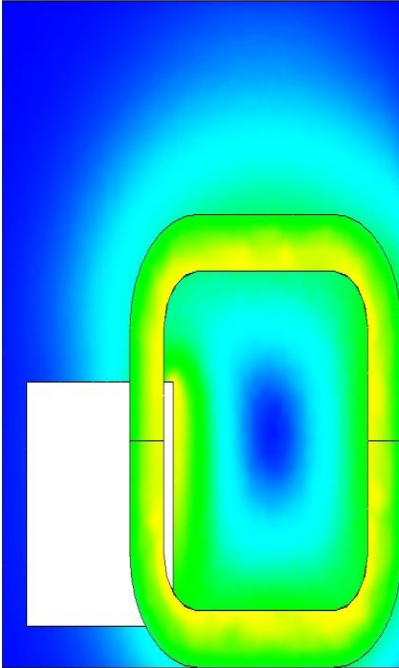
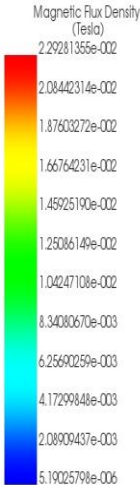
Energy (J)	Co-Energy (J)
3.026283e-001	0.000000e+000

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# 7. Magnetic Flux Density Results

## Magnetic Flux Density at wt=0

Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Magnetic Flux Density at wt=0 (Resultant)  
Part: Real  
Phase: 0.000 degree



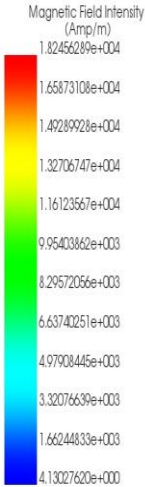
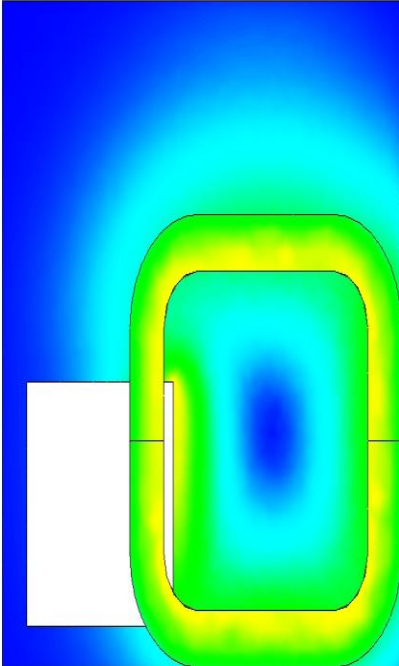




# 8. Magnetic Field Intensity Results

## Magnetic Field Intensity - 1

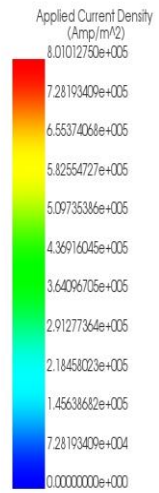
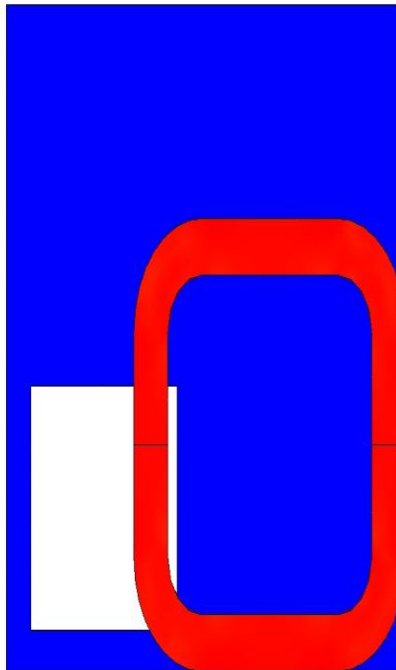
Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Magnetic Field Intensity - 1 (Resultant)  
Part: Real  
Phase: 0.000 degree



## 9. Applied Current Density Results

### Applied Current Density - 1

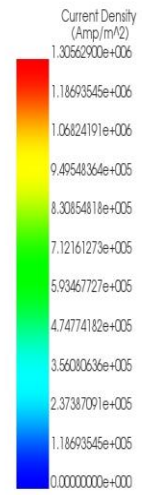
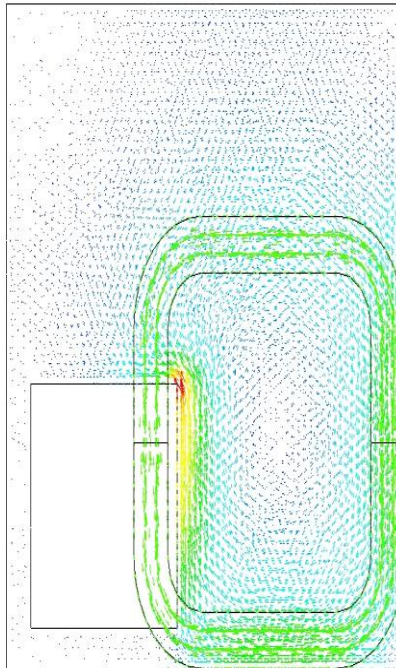
Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Applied Current Density - 1 (Resultant)  
Part: Real  
Phase: 0.000 degree



# 10. Current Density Results

## Current Density - 1

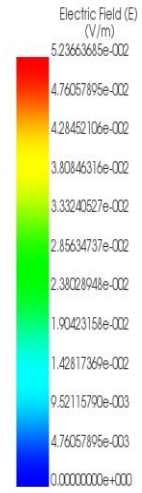
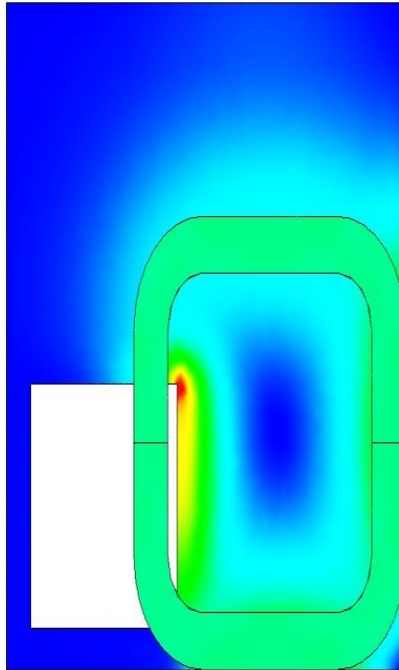
Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Current Density - 1 (Resultant)  
Part: Real  
Phase: 0.000 degree



# 11. Electric Field Results

## Electric Field - 1

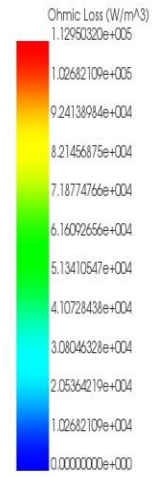
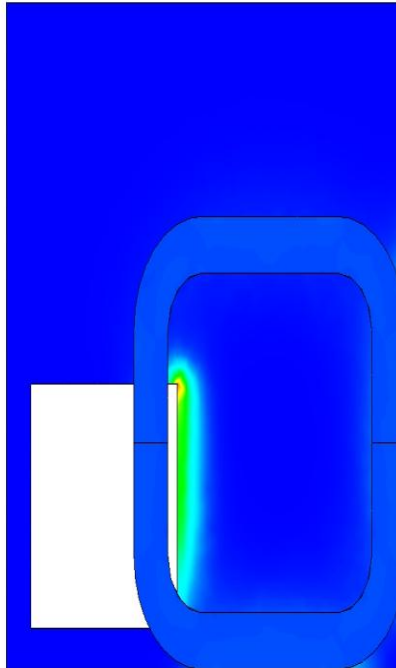
Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Electric Field - 1 (Resultant)  
Part: Real  
Phase: 0.000 degree



## 12. Losses Results

### Losses Density - 1

Model Name: Team Problem 7  
Study Name: Study 1  
Plot Name: Losses Density - 1 (Ohmic Loss)



### 13. Appendix

**Material Name:** Air

**Permeability Type:** Isotropic

**Note:** R.P. stands for Relative Permeability

<b>R.P.</b>	<b>Conductivity(Mho/m)</b>	<b>Permanent Magnet</b>	<b>Thermal Conductivity (W/m.K)</b>
0.000e+000	0.000e+000	No	2.400e-002

**Material Name:** Copper

**Permeability Type:** Isotropic

**Note:** R.P. stands for Relative Permeability

<b>R.P.</b>	<b>Conductivity(Mho/m)</b>	<b>Permanent Magnet</b>	<b>Thermal Conductivity (W/m.K)</b>
0.000e+000	5.700e+007	No	4.010e+002

**Material Name:** AluminiumForAC

**Permeability Type:** Isotropic

**Note:** R.P. stands for Relative Permeability

<b>R.P.</b>	<b>Conductivity(Mho/m)</b>	<b>Permanent Magnet</b>	<b>Thermal Conductivity (W/m.K)</b>
0.000e+000	3.526e+007	No	0.000e+000