Air coil

Density Plot: |B|, Tesla

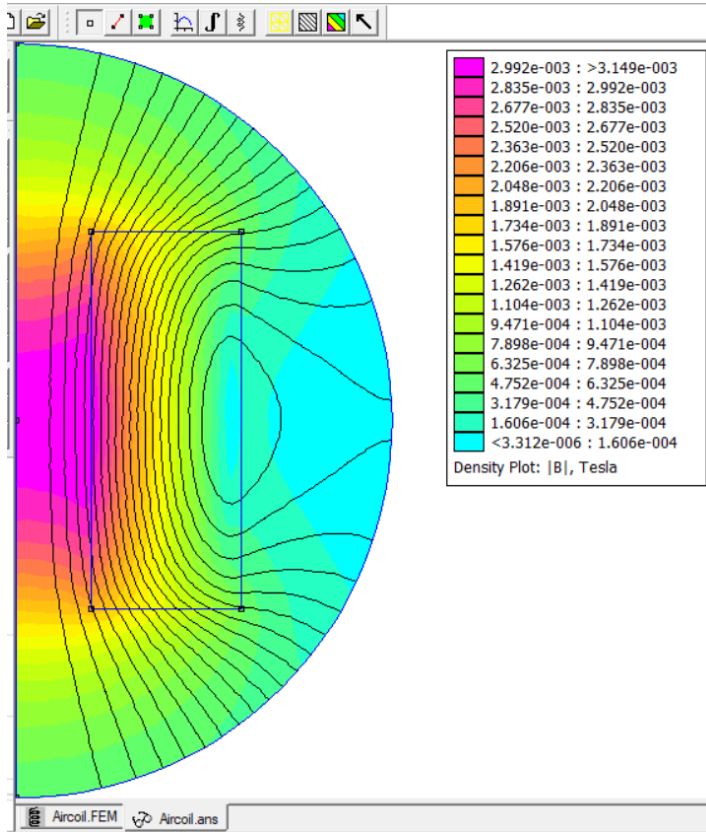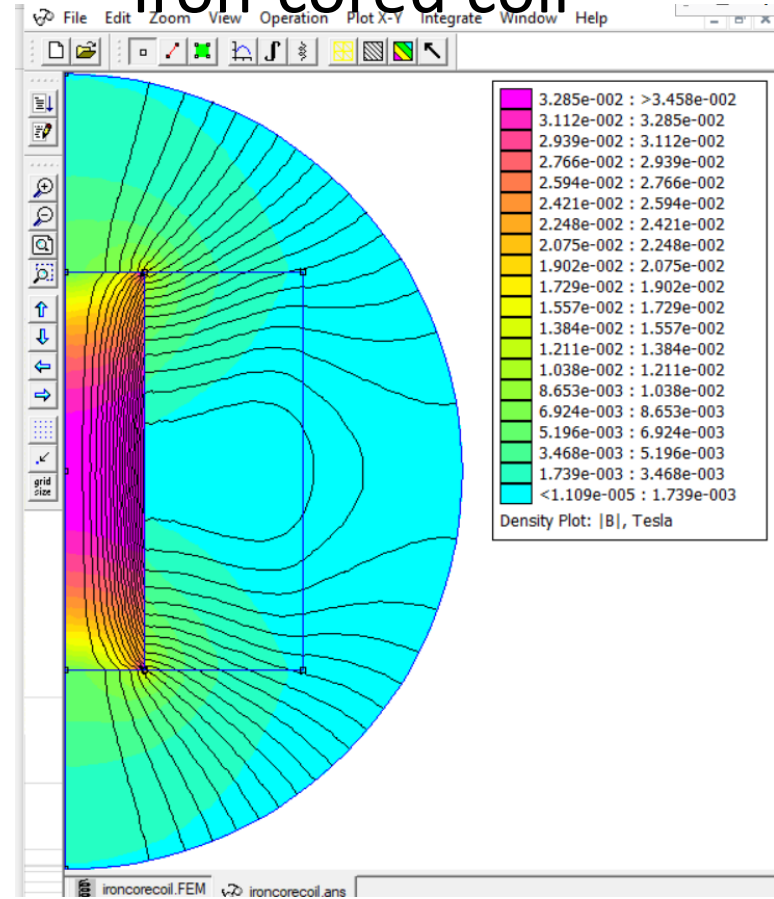|	
	2.992e-003 : >3.149e-003
	2.835e-003 : 2.992e-003
	2.677e-003 : 2.835e-003
	2.520e-003 : 2.677e-003
	2.363e-003 : 2.520e-003
	2.206e-003 : 2.363e-003
	2.048e-003 : 2.206e-003
	1.891e-003 : 2.048e-003
	1.734e-003 : 1.891e-003
	1.576e-003 : 1.734e-003
	1.419e-003 : 1.576e-003
	1.262e-003 : 1.419e-003
	1.104e-003 : 1.262e-003
	9.471e-004 : 1.104e-003
	7.898e-004 : 9.471e-004
	6.325e-004 : 7.898e-004
	4.752e-004 : 6.325e-004
	3.179e-004 : 4.752e-004
	1.606e-004 : 3.179e-004
	<3.312e-006 : 1.606e-004

Aircoil.FEM   Aircoil.ans

Circuit Name
coil

Results
Total current = 1.5 Amps
Voltage Drop = 0.394651 Volts
Flux Linkage = 0.000263237 Webers
Flux/Current = 0.000175491 Henries
Voltage/Current = 0.2631 Ohms
Power = 0.591976 Watts

OK

Iron-cored coil

File Edit Zoom View Operation Plot X-Y Integrate Window Help

Density Plot: |B|, Tesla

	3.285e-002 : >3.458e-002
	3.112e-002 : 3.285e-002
	2.939e-002 : 3.112e-002
	2.766e-002 : 2.939e-002
	2.594e-002 : 2.766e-002
	2.421e-002 : 2.594e-002
	2.248e-002 : 2.421e-002
	2.075e-002 : 2.248e-002
	1.902e-002 : 2.075e-002
	1.729e-002 : 1.902e-002
	1.557e-002 : 1.729e-002
	1.384e-002 : 1.557e-002
	1.211e-002 : 1.384e-002
	1.038e-002 : 1.211e-002
	8.653e-003 : 1.038e-002
	6.924e-003 : 8.653e-003
	5.196e-003 : 6.924e-003
	3.468e-003 : 5.196e-003
	1.739e-003 : 3.468e-003
	<1.109e-005 : 1.739e-003

ironcorecoil.FEM   ironcorecoil.ans

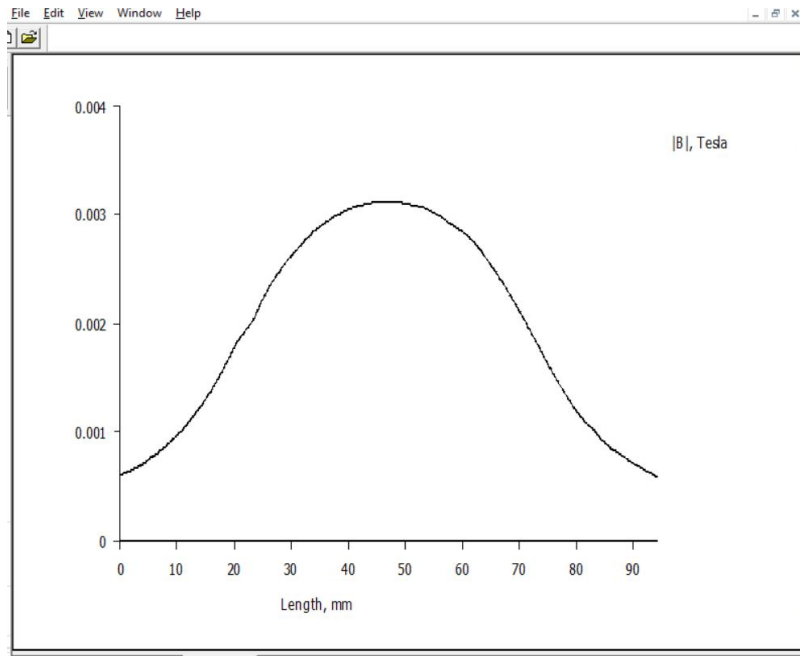## Circuit Properties

Circuit Name
coil

Results
Total current = 1.5 Amps
Voltage Drop = 0.394651 Volts
Flux Linkage = 0.000951037 Webers
Flux/Current = 0.000634024 Henries
Voltage/Current = 0.2631 Ohms
Power = 0.591976 Watts

OK

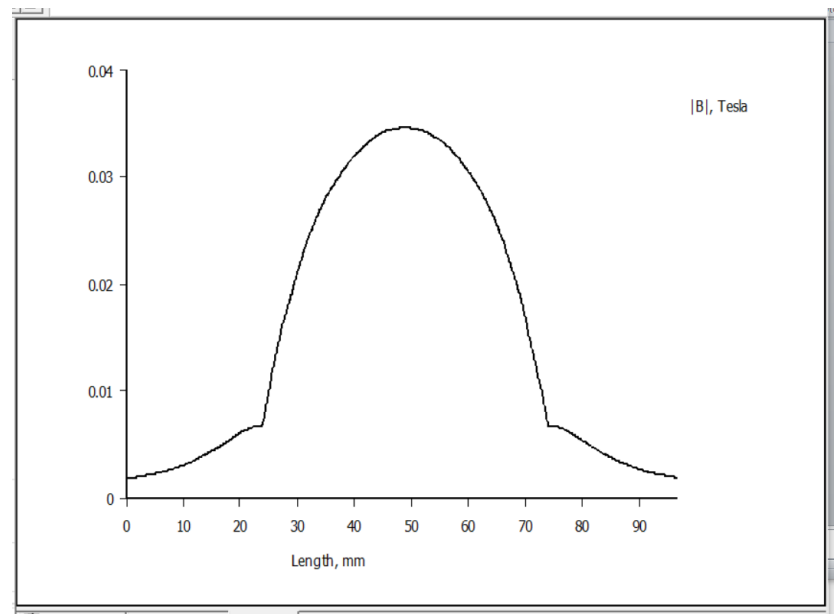# Air coil
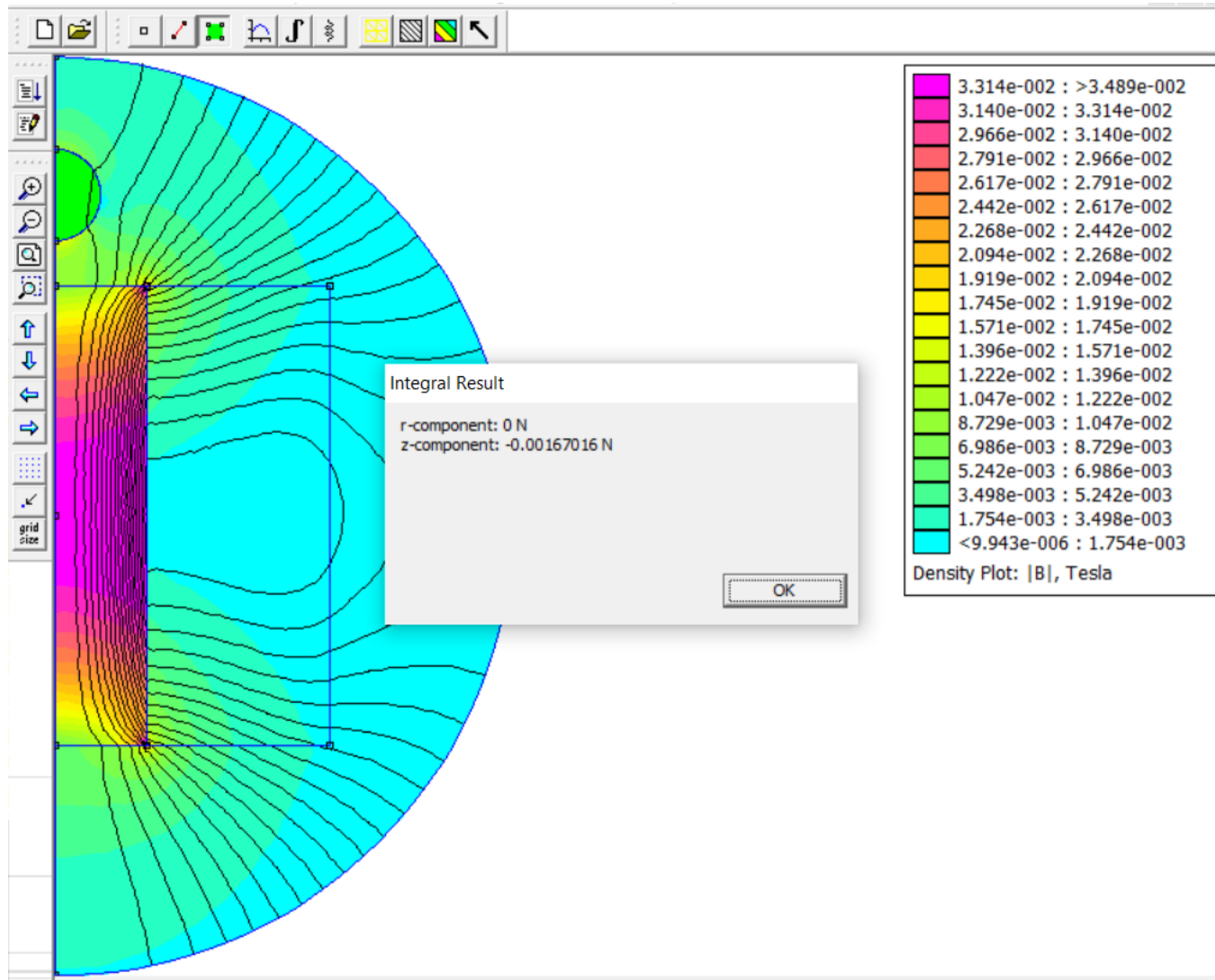
Inductance = Flux/current
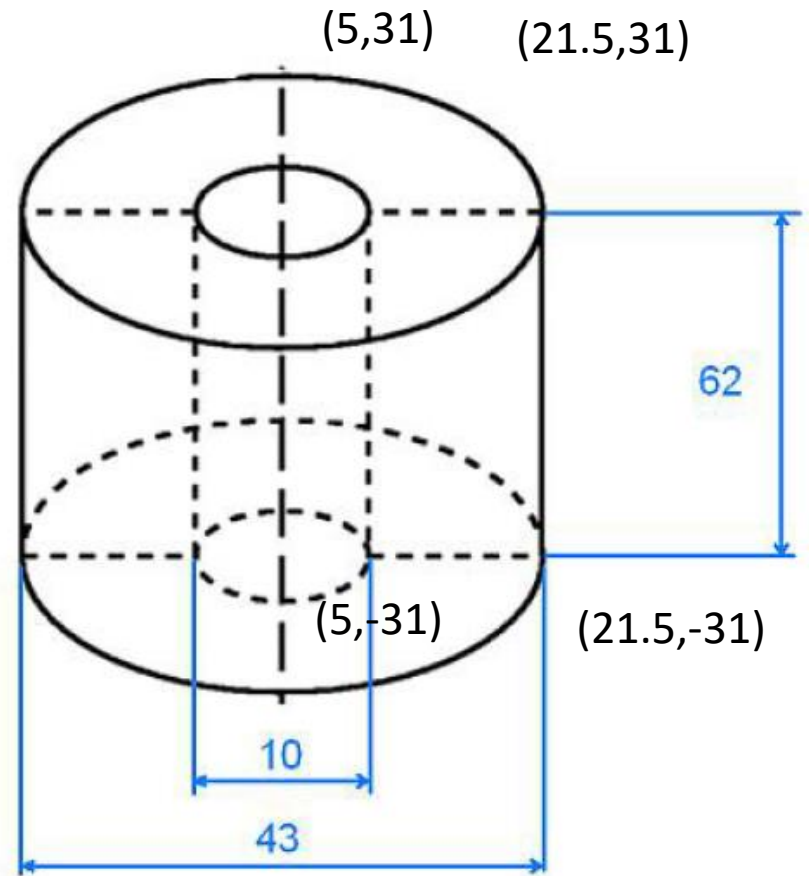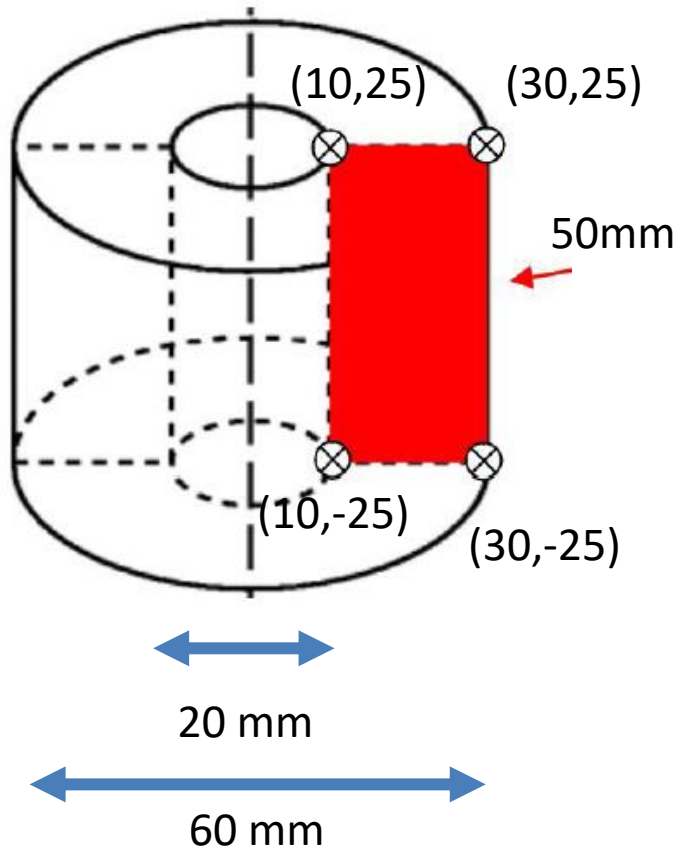
L = 175 uH

Iron-cored coil

Inductance = Flux/current

L = 634 uH

Coilgun with the iron ball
Force F=1.67 mN

(10,25) (30,25)

50mm

(10,-25) (30,-25)

20 mm

60 mm

(5,31) (21.5,31)

62

(5,-31) (21.5,-31)

10

43

J=I/Area => I=J*Area=1.285A

J=2.5 A/mm2

Area=0.514 mm2

Pot core choke
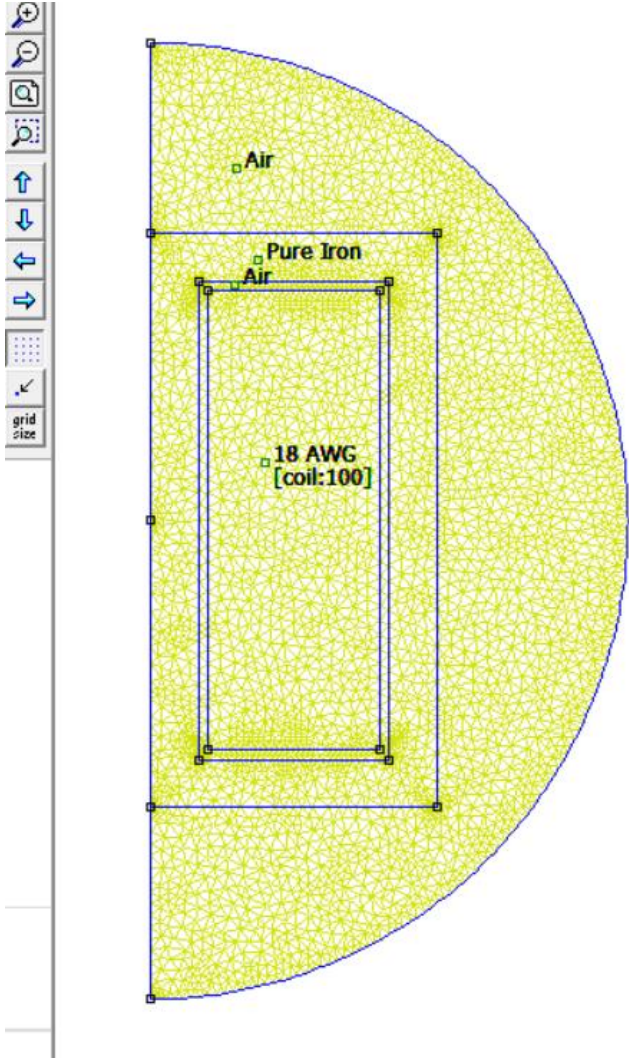
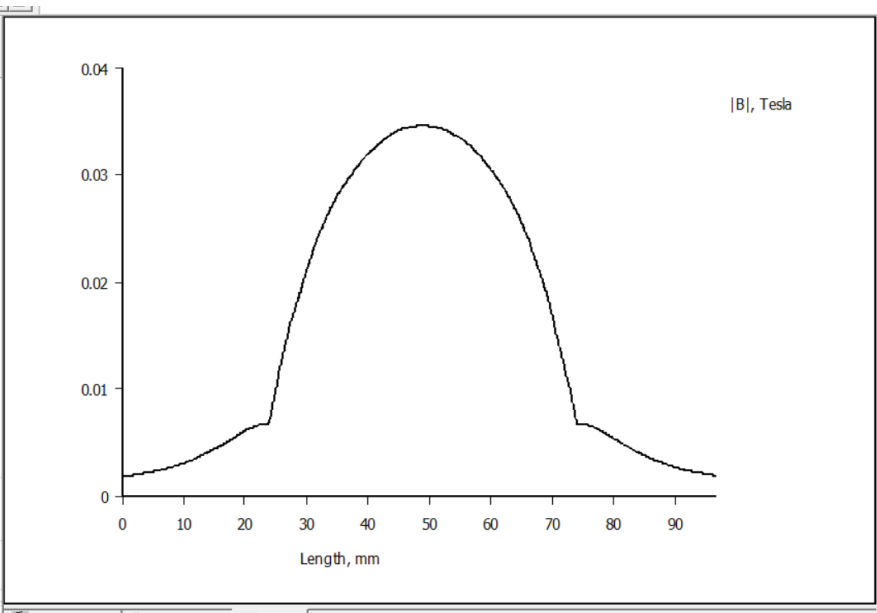## Iron-cored coil

Inductance = Flux/current

L = 634 uH

Pot-core choke

Inductance = Flux/current

L = 6.77 mH
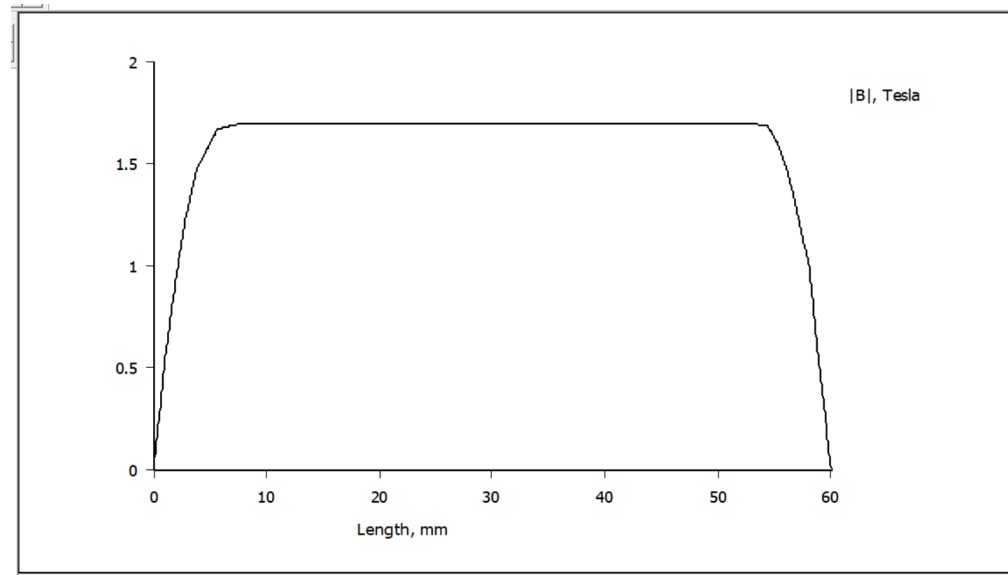
Iron-cored coil
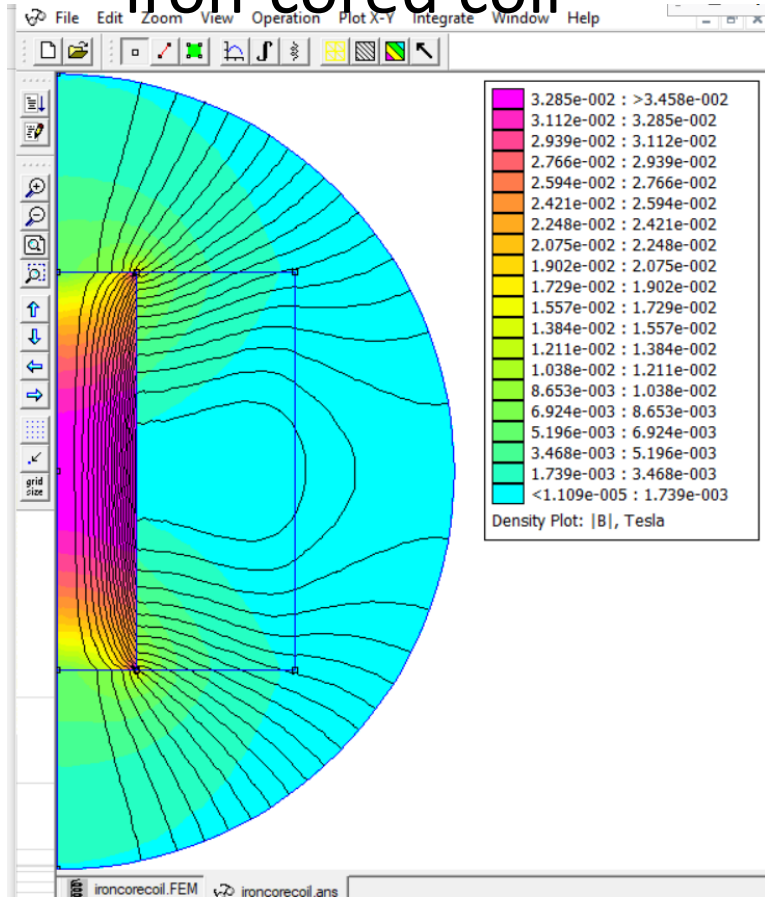
Density Plot: |B|, Tesla

3.285e-002 : >3.458e-002	
3.112e-002 : 3.285e-002	
2.939e-002 : 3.112e-002	
2.766e-002 : 2.939e-002	
2.594e-002 : 2.766e-002	
2.421e-002 : 2.594e-002	
2.248e-002 : 2.421e-002	
2.075e-002 : 2.248e-002	
1.902e-002 : 2.075e-002	
1.729e-002 : 1.902e-002	
1.557e-002 : 1.729e-002	
1.384e-002 : 1.557e-002	
1.211e-002 : 1.384e-002	
1.038e-002 : 1.211e-002	
8.653e-003 : 1.038e-002	
6.924e-003 : 8.653e-003	
5.196e-003 : 6.924e-003	
3.468e-003 : 5.196e-003	
1.739e-003 : 3.468e-003	
<1.109e-005 : 1.739e-003	

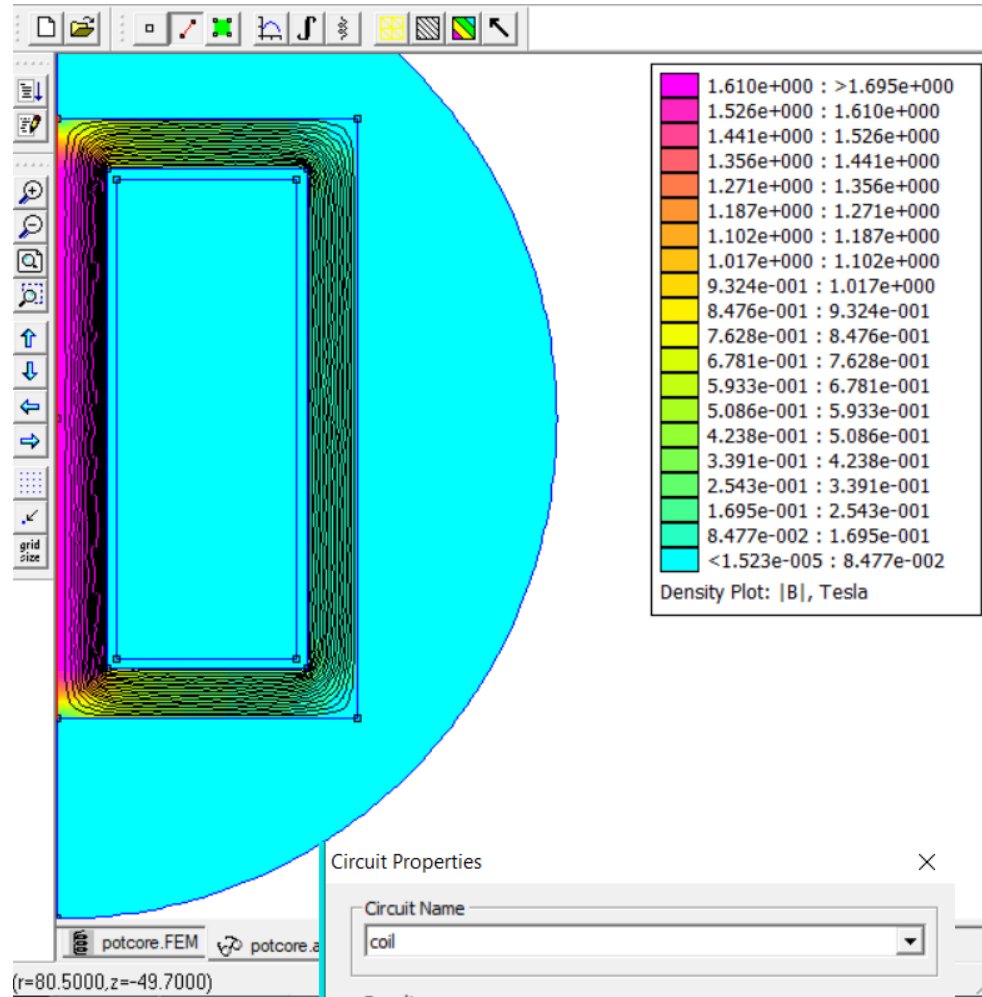ironcorecoil.FEM   ironcorecoil.ans

Circuit Properties

Circuit Name

coil

Results

Total current = 1.5 Amps
Voltage Drop = 0.394651 Volts
Flux Linkage = 0.000951037 Webers
Flux/Current = 0.000634024 Henries
Voltage/Current = 0.2631 Ohms
Power = 0.591976 Watts

OK

Pot-core choke

Density Plot: |B|, Tesla

1.610e+000 : >1.695e+000	
1.526e+000 : 1.610e+000	
1.441e+000 : 1.526e+000	
1.356e+000 : 1.441e+000	
1.271e+000 : 1.356e+000	
1.187e+000 : 1.271e+000	
1.102e+000 : 1.187e+000	
1.017e+000 : 1.102e+000	
9.324e-001 : 1.017e+000	
8.476e-001 : 9.324e-001	
7.628e-001 : 8.476e-001	
6.781e-001 : 7.628e-001	
5.933e-001 : 6.781e-001	
5.086e-001 : 5.933e-001	
4.238e-001 : 5.086e-001	
3.391e-001 : 4.238e-001	
2.543e-001 : 3.391e-001	
1.695e-001 : 2.543e-001	
8.477e-002 : 1.695e-001	
<1.523e-005 : 8.477e-002	

potcore.FEM   potcore.a

(r=80.5000,z=-49.7000)

Circuit Properties

Circuit Name

coil

Results

Total current = 2 Amps
Voltage Drop = 0.394651 Volts
Flux Linkage = 0.0135411 Webers
Flux/Current = 0.00677057 Henries
Voltage/Current = 0.197325 Ohms
Power = 0.789301 Watts

OK