

Magnetostatic Analysis of Study 1

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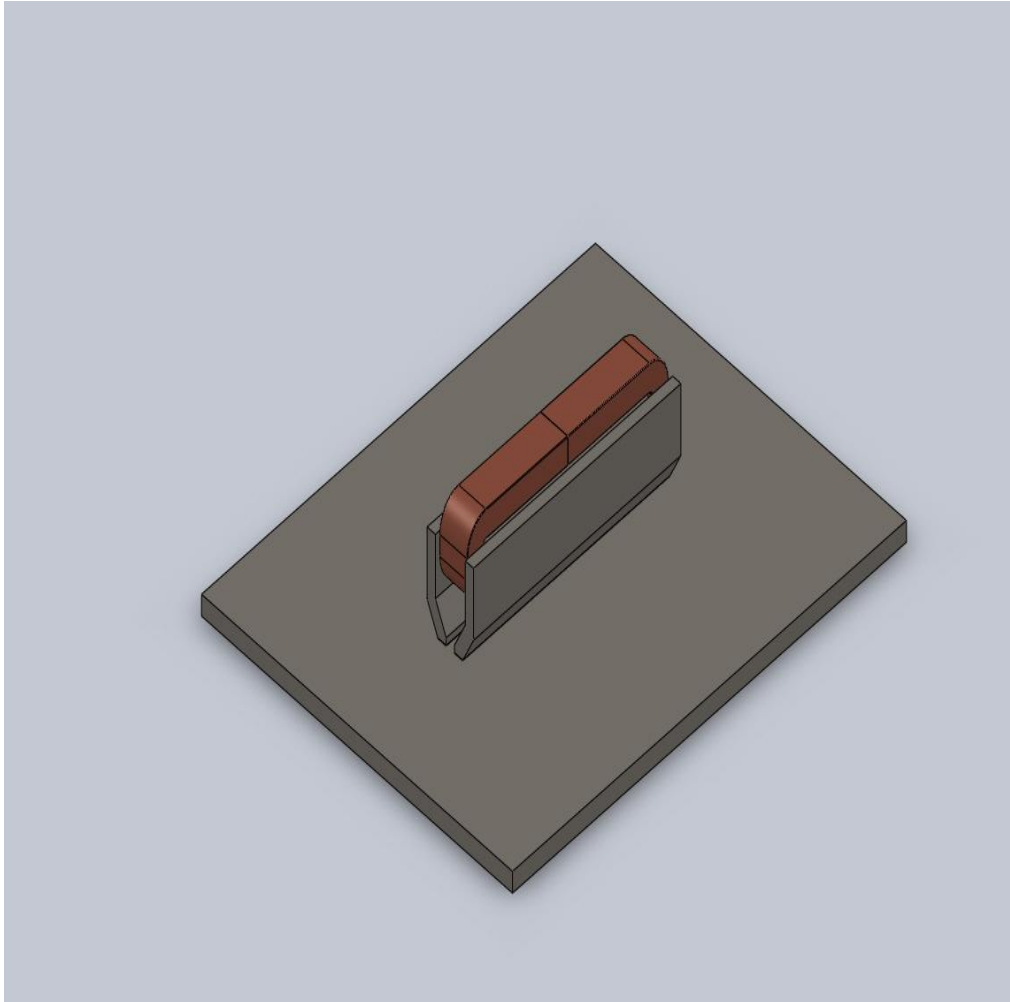
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1. Introduction

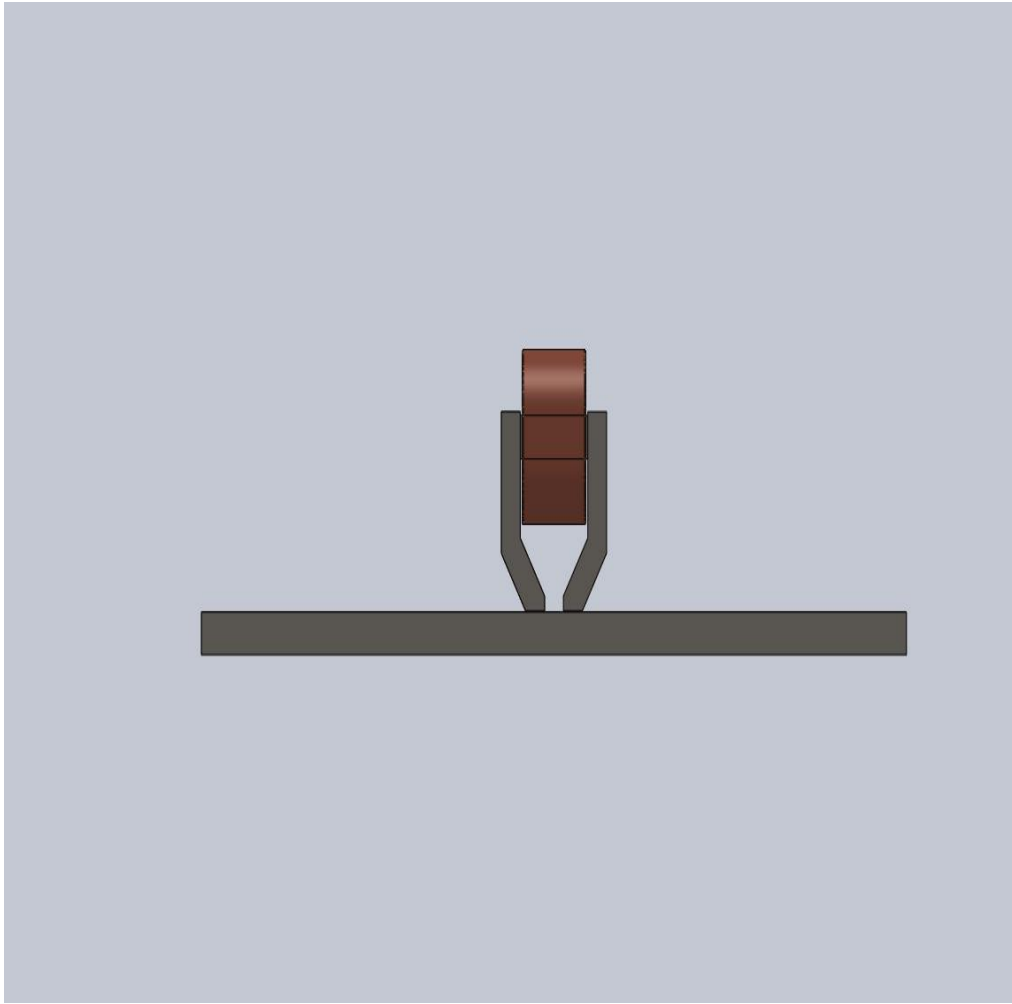
This report covers the magnetic parameters resulting from a static analysis of a steel plate that is lifted using an electromagnet. The force applied on the steel plate is a result of the electromagnetic phenomena.

2. Model View

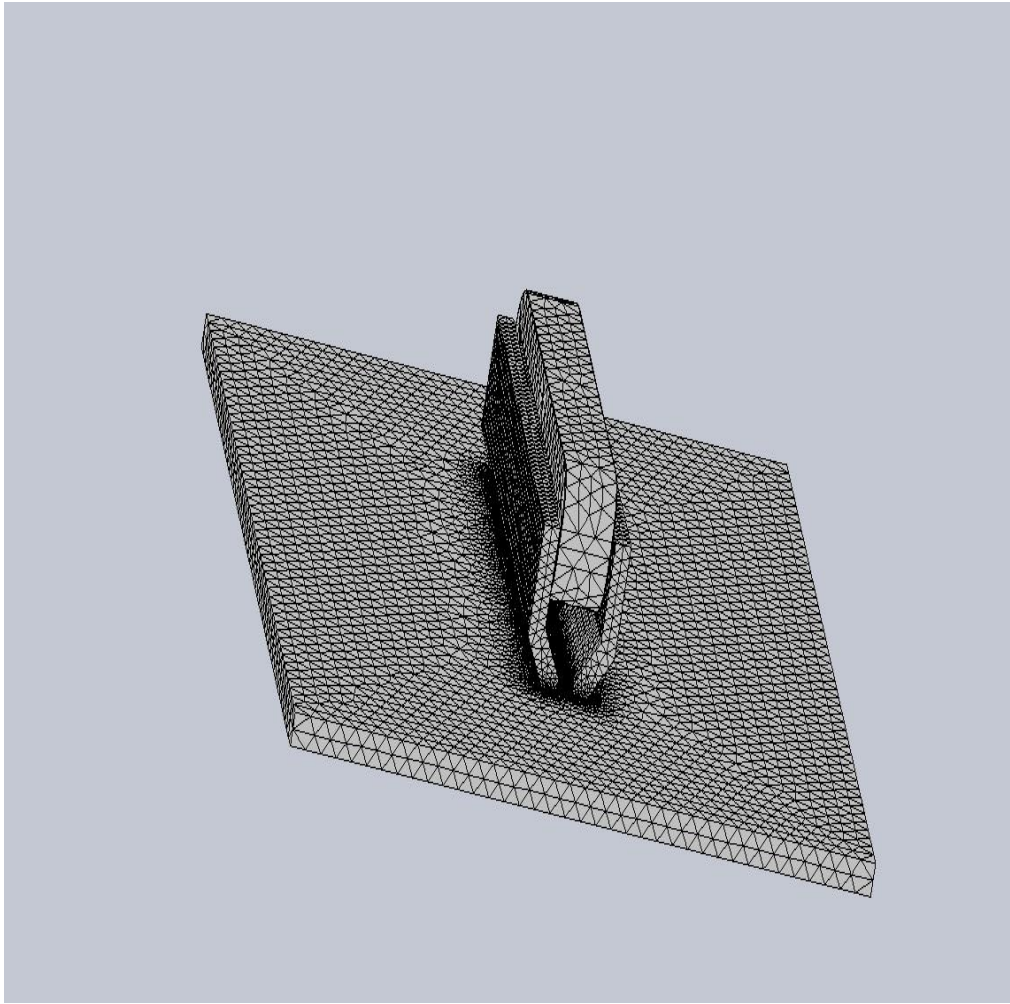
Assy-magnet-parasolid_Isometric View



Assy-magnet-parasolid_Front View



Assy-magnet-parasolid_Current View (Mesh)



3. Materials

Note: R.P. stands for Relative Permeability

Nb r.	Part Name	Material Name	Permeability Type
1	0109001-510 vb(Default_As Machined_-)1-Body 1 (Split2[1])	Aluminium	Isotropic
2	0109001-510 vb(Default_As Machined_-)1-Body 2 (Split2[2])	Aluminium	Isotropic
3	InnerAir^Assy-magnet-parasolid-1-Body 1 (Extrude1[1])	Air	Isotropic
4	InnerAir^Assy-magnet-parasolid-1-Body 2 (Extrude1[2])	Air	Isotropic
5	Kern(Default_As Machined_-)1-Body 1 (Imported1)	Steel1010	Isotropic
6	OuterAir^Assy-magnet-parasolid-1-Body 1 (Cavity1)	Air	Isotropic
7	Side(Default_As Machined_-)1-Body 1 (Imported1)	Steel1010	Isotropic
8	Side(Default_As Machined_-)2-Body 1 (Imported1)	Steel1010	Isotropic
9	Steelplate(Default_As Machined_-)1-Body 1 (Cut-Extrude1)	Steel1010	Isotropic

4. Coils Information

Coils

Nb r.	Name	Nbr.Of Turns	Magnitude	Phase	Components & Bodies
1	Wound Coil - 1	1000	1.736000e+001	0.0000e+000deg	0109001-510 vb(Default_As Machined_-)1

5. Force and Torque Information

Nbr.	Name	Torque Center	Components & Bodies
1	Virtual Work - 1	At origin	Steelplate(Default_As Machined_)-1

6. Study Properties

Mesh Information

Nbr.Of Nodes	Nbr.Of Elements	Element Size (m)	Tolerance (m)
52648	311884	0.500000	0.000100

Mesh Controls information

Nb r.	Name	Mesh Size	Size Unit	Components & Bodies	Selected Faces
1	MeshControl - 1	40.000000	mm	Steelplate(Default_As Machined_)-1	
2	MeshControl - 2	20.000000	mm	Side(Default_As Machined_)-1 Side(Default_As Machined_)-2 Kern(Default_As Machined_)-1	
3	MeshControl - 3	40.000000	mm	0109001-510 vb(Default_As Machined_)-1	

4	MeshControl - 4	5.000000	mm	InnerAir-1	
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Solver information

Solver Type	Nbr. Current Increments	Compute Circuit Parameters
Direct Solver	1	No

7. Results Table

Force Results

	Fx-axis (N)	Fy-axis (N)	Fz-axis (N)
Virtual Work - 1	3.295106e+001	6.863264e+004	6.932427e+000

Torque Results

	Tx-axis (N.m)	Ty-axis (N.m)	Tz-axis (N.m)
Virtual Work - 1	7.209524e+001	3.391378e+000	-6.157644e+000

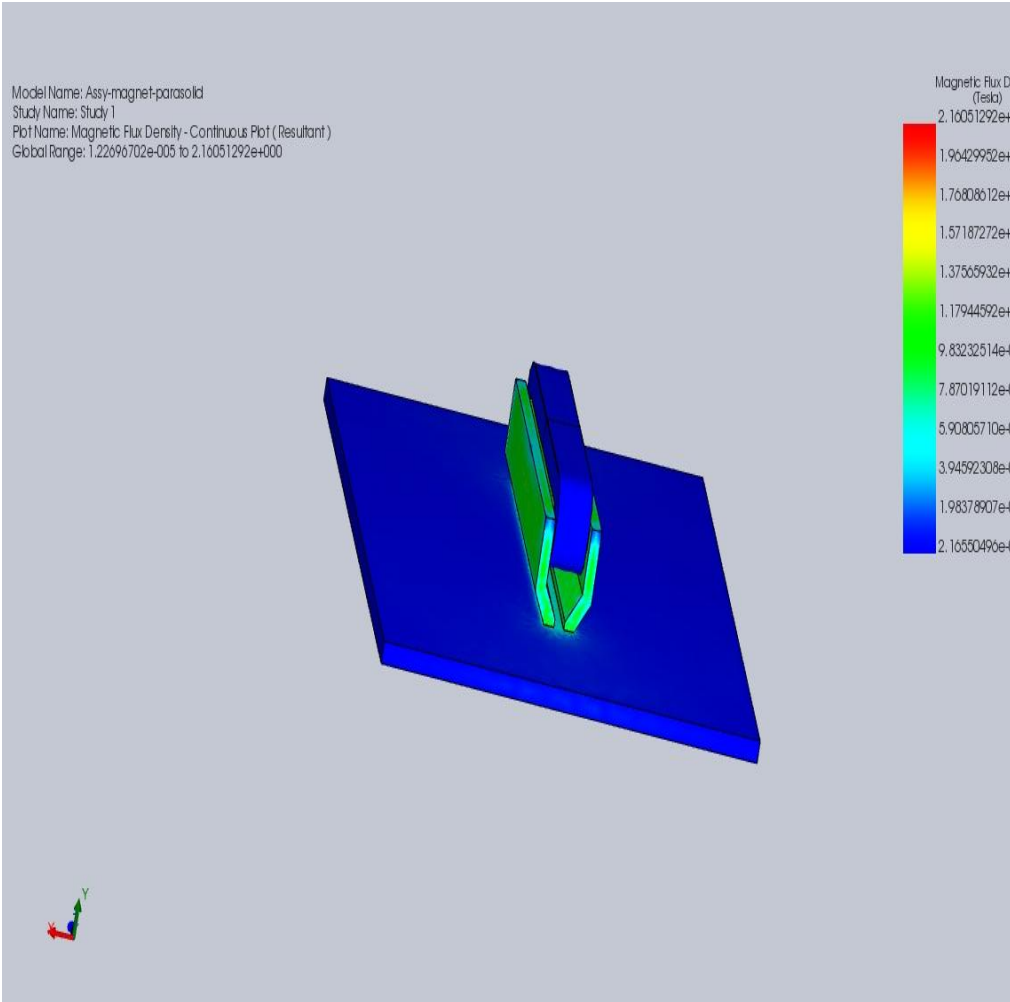
Energy Results

Energy (J)	Co-Energy (J)
3.262926e+002	1.301500e+003

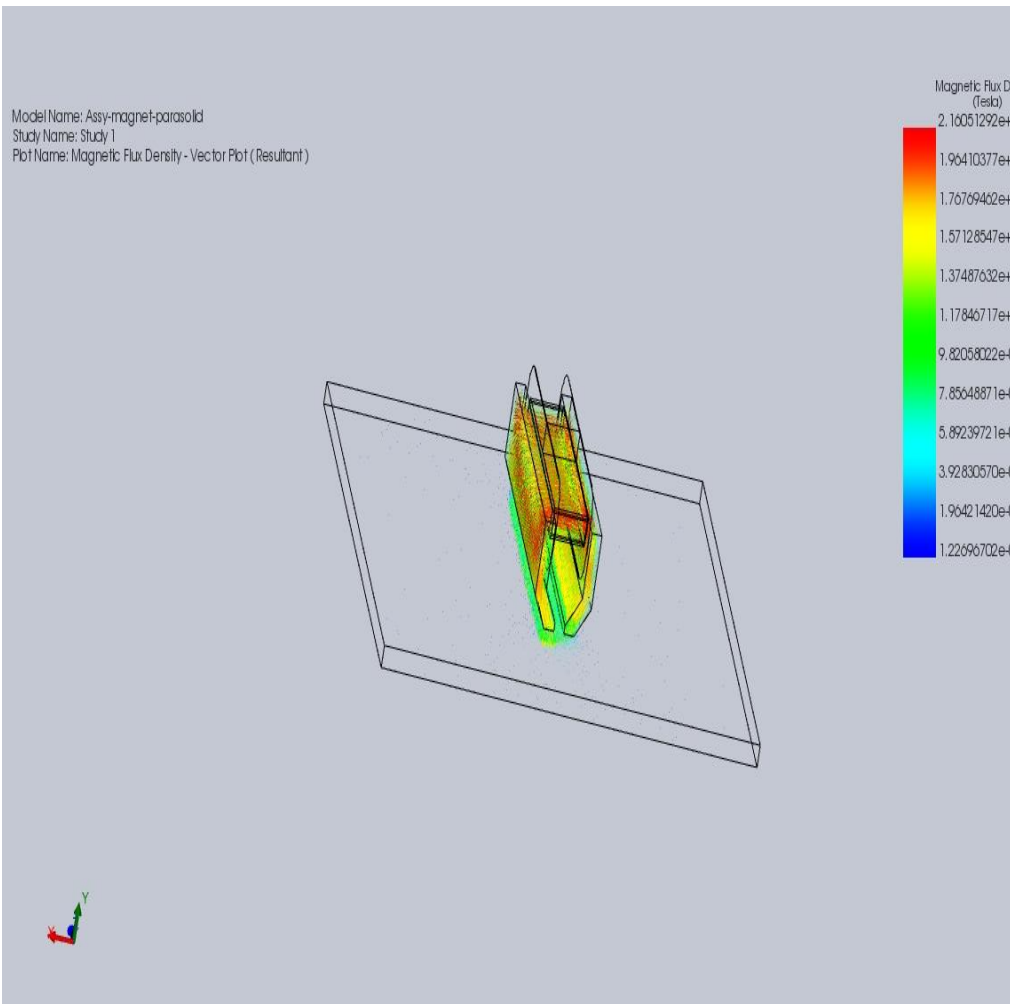
8. Magnetic Flux Density Results

Magnetic Flux Density - Continuous Plot

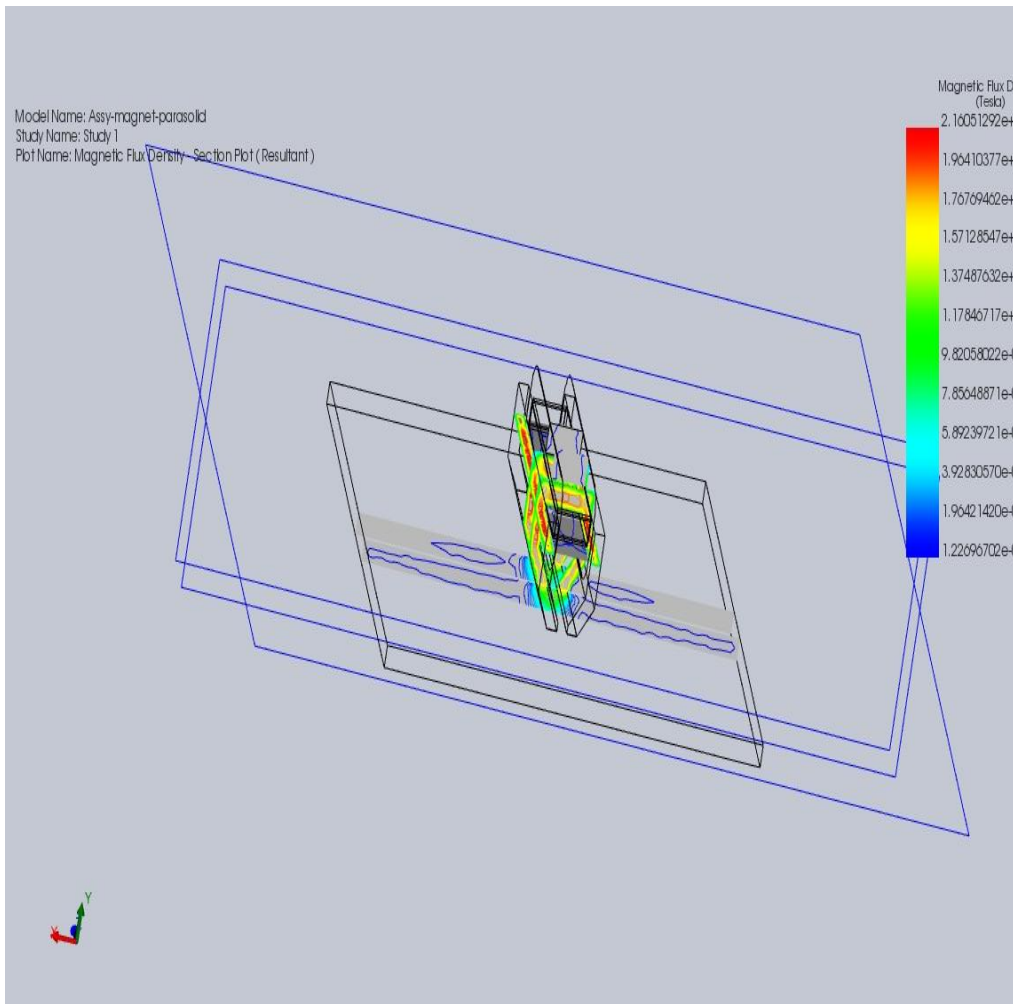
JPEG



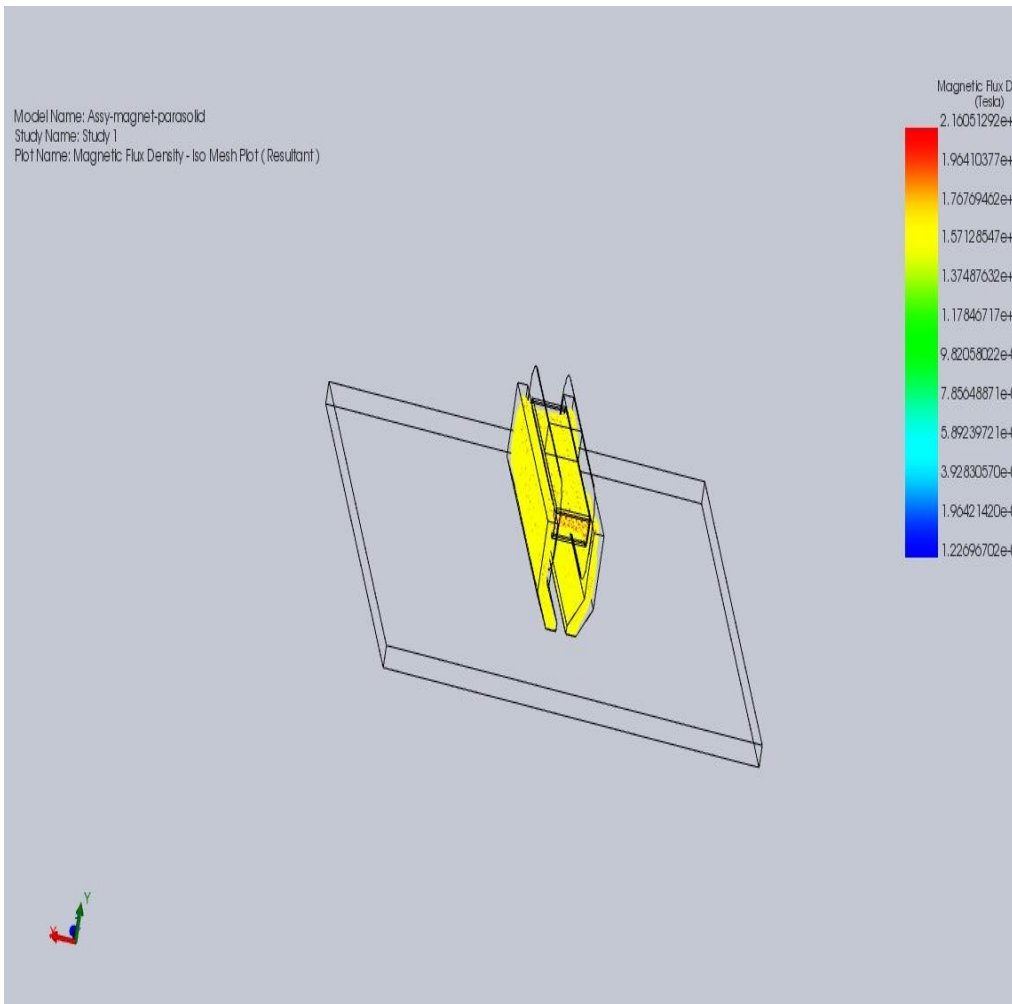
Magnetic Flux Density - Vector Plot



Magnetic Flux Density - Section Plot

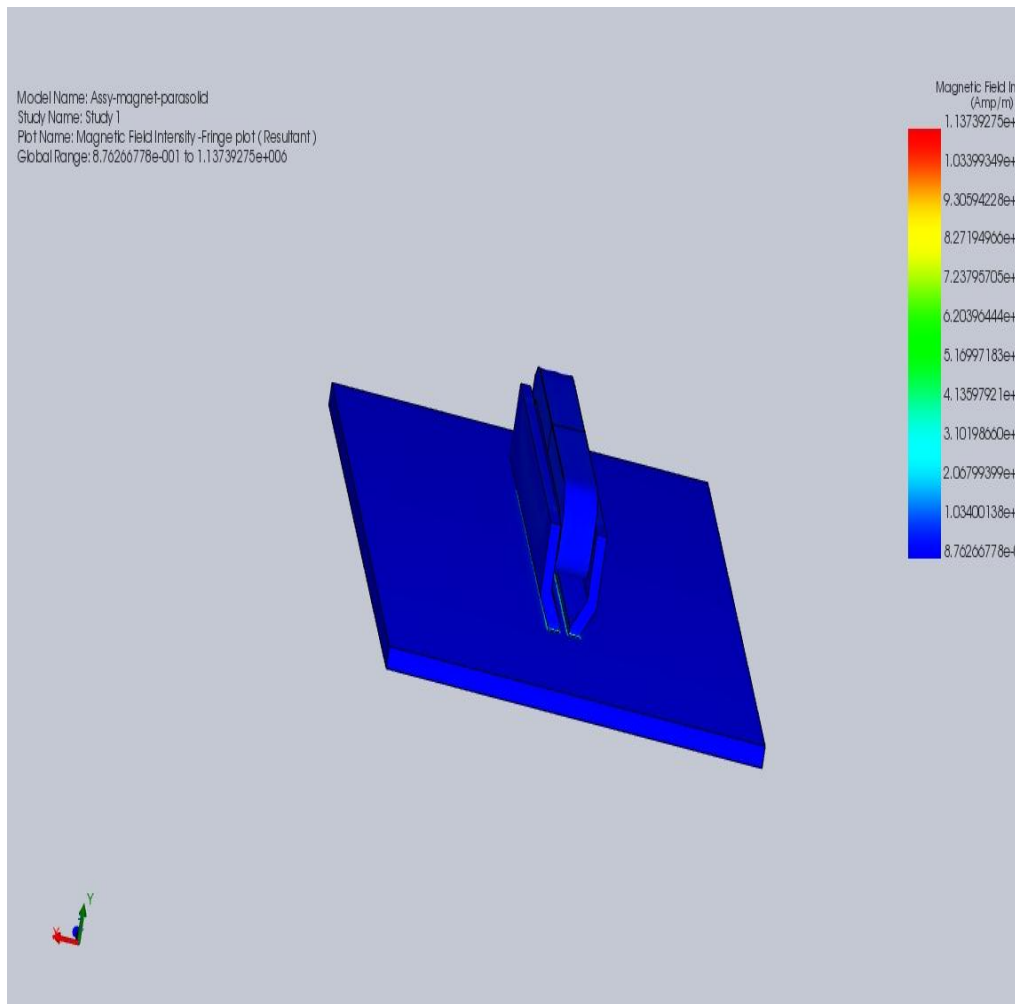


Magnetic Flux Density - Iso Mesh Plot

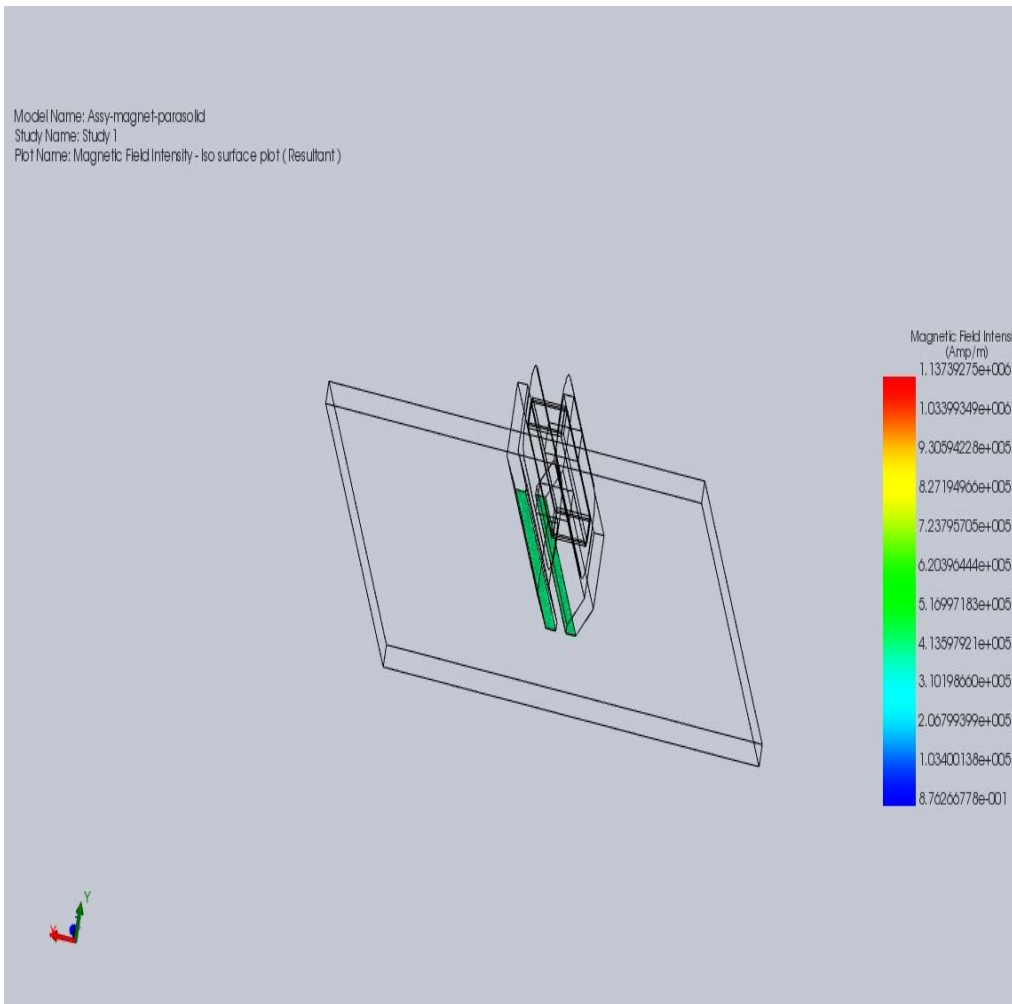


9. Magnetic Field Intensity Results

Magnetic Field Intensity -Fringe plot



Magnetic Field Intensity - Iso surface plot



10. Applied Current Density Results

Applied Current Density - Vector Plot

