

ANSYS AIM 3D Static Force Computation - Numerical Solution

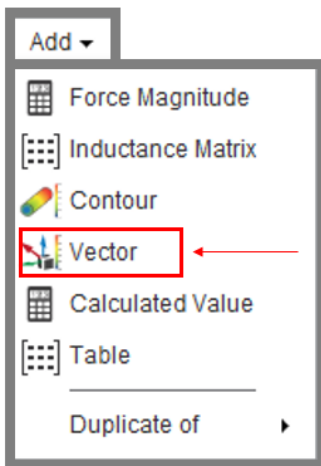
Author(s): Joshua Wallace & Steve Scampoli, ANSYS Inc.

[Problem Specification](#)

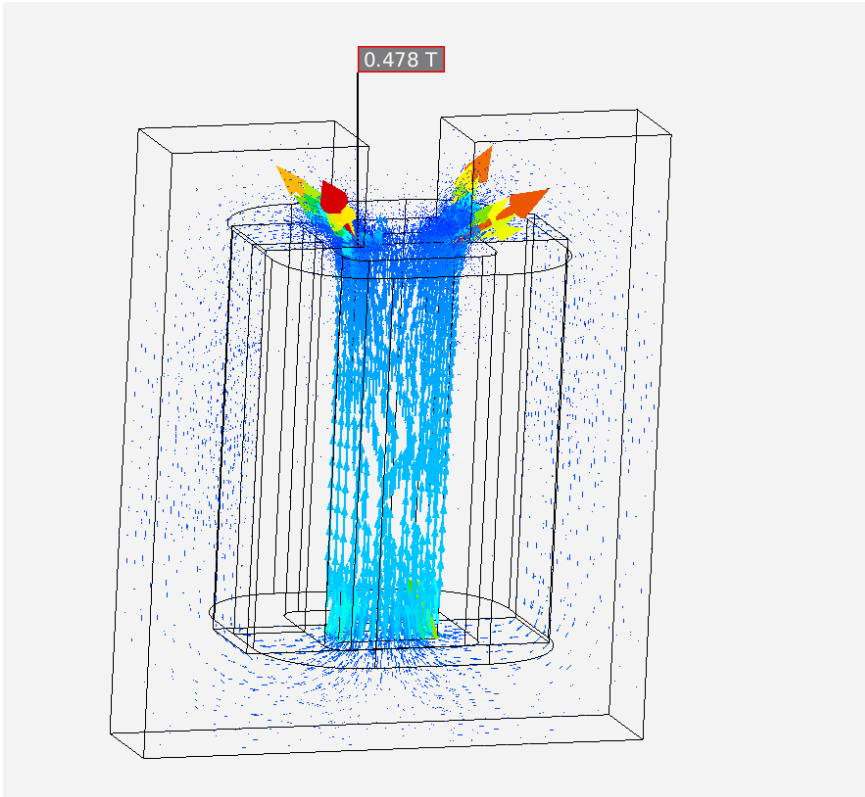
- [1. Pre-Analysis & Start-Up](#)
- [2. Geometry](#)
- [3. Physics Setup](#)
- [4. Solution/Results](#)

Solution/Result

Select **Results** in the workflow and click on **Evaluate Results**. Note that in the bottom right hand corner the progress on the solution can be seen. AIM will automatically adapt the mesh until the percent energy error is below the prescribed amount. Once this condition is met, the magnetic field and electromagnetic force can be calculated. In order to take a look at the magnetic field, go to **Add** and click on **Vector**.



Choose **Magnetic Flux Density** for the **Variable** and click **Evaluate**. To adjust the size of the vectors click on **Appearance** and change the **Symbol Sizing** to 0.5. The result should look like this:



To view the force on the center pole, go back to the **Results** window and click on **Value Force Magnitude**.

Finally, we need to parametrize the force. Across from the the calculated results is a small black arrow. Click on the arrow and then click on the P. Click on the **Design Points** dashboard in the upper right hand corner.



Input an **Operating Current** of 5, 15, 22.5 and 25 Amps to generate 1000, 3000, 4500 and 5000 Amp-Turns in the stranded coil. Then click **Update All**.

P1 - Current 1 Operating current	A ▼	P2 - Calculated Value 1 Value	N ▼
5		104.58	
15		1022.8	
22.5		2483.7	
25		2935.5	

[Go to Problem Specification](#)

[Go to all ANSYS AIM Learning Modules](#)