## **ANSYS Forces in Permanent Magnets - Geometry**

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Problem Specification 1. Pre-Analysis & Start-Up

- 2. Geometry
- 3. Physics Setup
- 4. Case Setup
- 5. Solution/Results

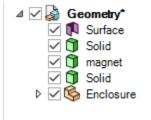
## **Geometry**

You will be prompted to either **Define new geometry**, **Import geometry file**, or **Connect to active CAD session**. Select **Import new geometry** and downloaded the file <u>here</u>. AIM will prompt again asking to select your calculation type, physics coupling and options. Under **Options**, check **Compute force** and then click **Finish**.

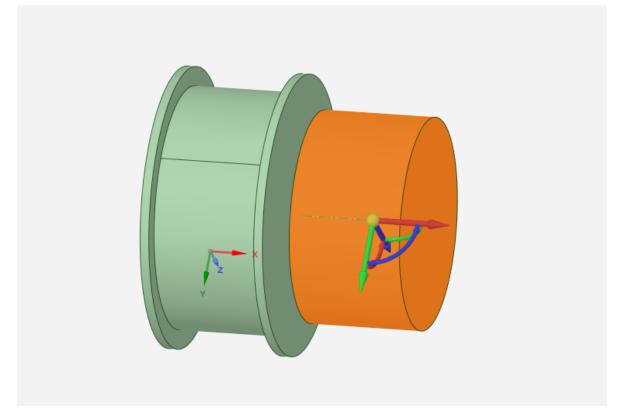
Magnetics: Physics
Calculation type: Static Frequency response
Physics coupling: Solid heating due to electromagnetic effects Electromagnetic effects due to solid heating
Options: ⑦
✓ Create surrounding region
<ul> <li>✓ Compute inductance</li> <li>✓ Compute force</li> <li>✓ Compute force</li> </ul>
Compute torque
Typical settings and results will be defined automatically.
Back Finish

## Creating geometric parameters

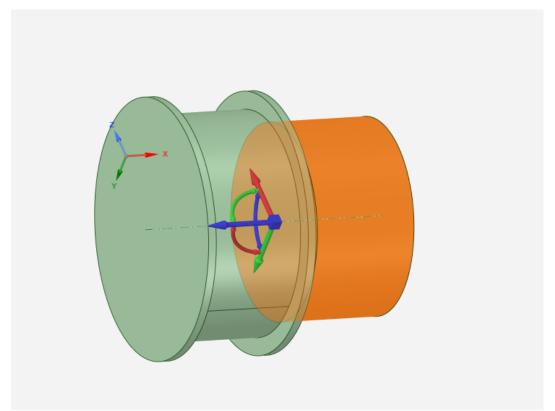
In order to vary the horizontal distance between the coil and magnet a parameter must be created. Once AIM has loaded click on **Geometry** > Edit Geometry. Hide the enclosure by deselecting the checkmark.



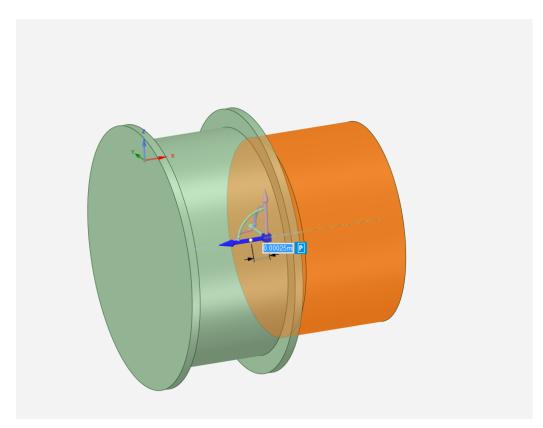
Triple click on the magnet to select the body. Select the Move tool and click on the origin.



Drag the origin onto the face of the magnet closest to the spool.



Once the origin turns into a square, select the blue axis of the **Move** tool. The other axis will be greyed out and in the **General** sidebar select the **Ruler** tool. The **Ruler** tool will then follow the cursor, at which point click the face of the spool closest to the inside the gap.



To create the parameter, click on the **P** next to the highlighted dimension box. Once the parameter is created, click the x in the top right corner to begin the physics set up.

## Go to Step 3: Physics Setup

Go to all ANSYS AIM Learning Modules