# Calibration Protocol with 3D Slicer:

## Required Materials:

- **Aurora EM Generator**
- **Aurora EM Coils (x2) (inside probes)**
- **Target Plate**
- **Pen Probe**
- **EIT Probe**
- **Target Plate, Pen Probe, and EIT Probe STL files**
- **3D Slicer v5**
- **Plus Server Launcher**

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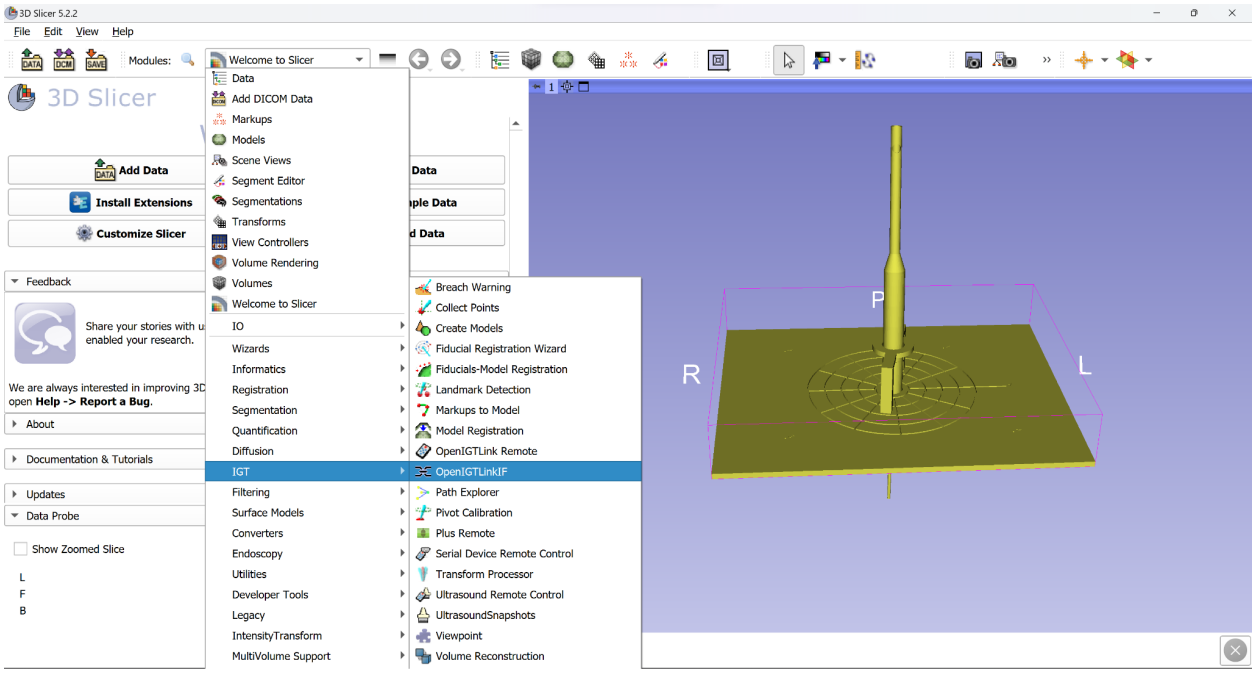
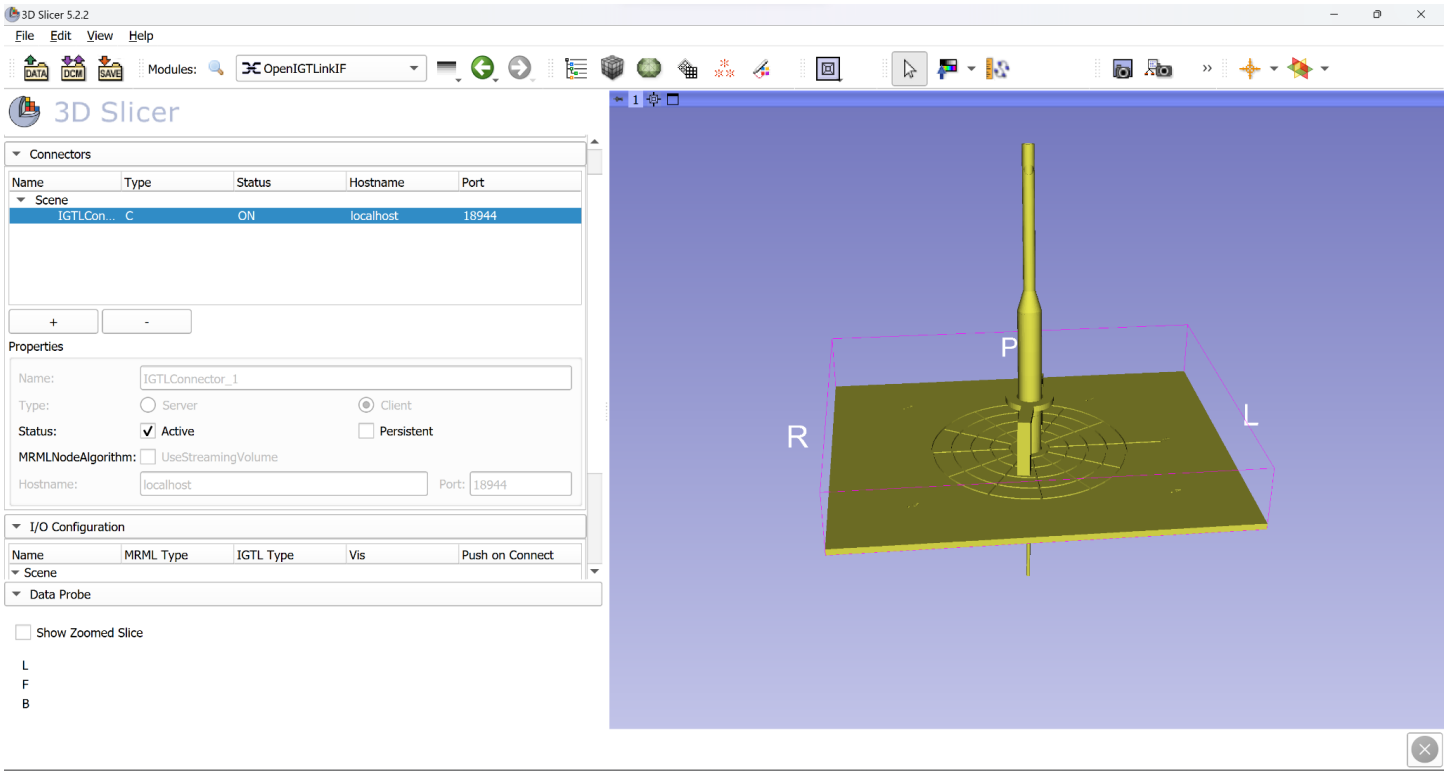
## Procedure:

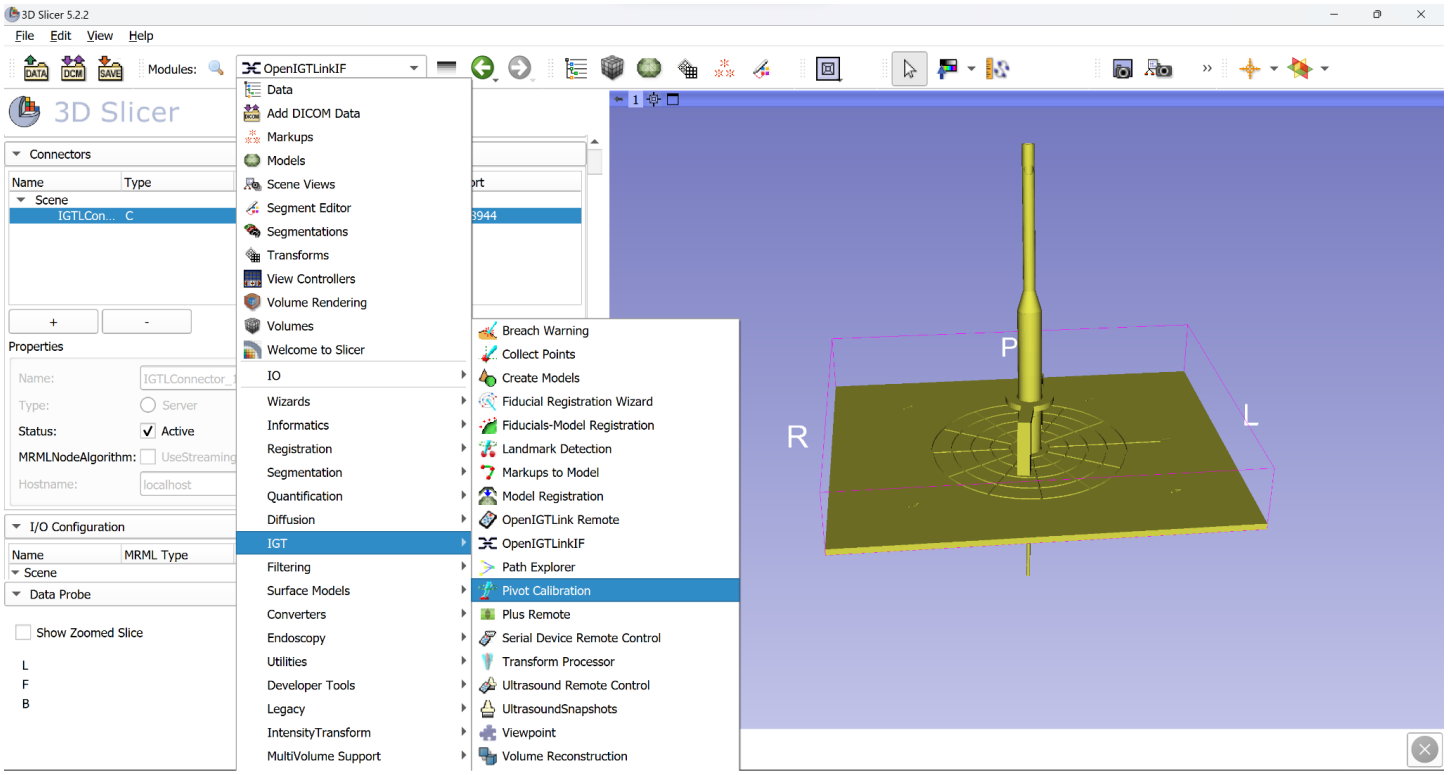
1. Connect probes to Aurora and Aurora to the computer.
    a. Connect Pen Probe to Port 1
    b. Connect Probe Coil to Port 2
2. Turn on Aurora
3. Open 3D Slicer 5
4. Launch Plus Server Launcher
5. Set Device Configuration Directory to ‘Aurora Two Tools’
6. Click Launch and should hear beep
7. Upload aurora_target_flex.STL, flexProbe.STL, and NeedleModel.STL files to 3D slicer
8. From 3D Slicer, go to **IGT → OpenIGTLinkIF**



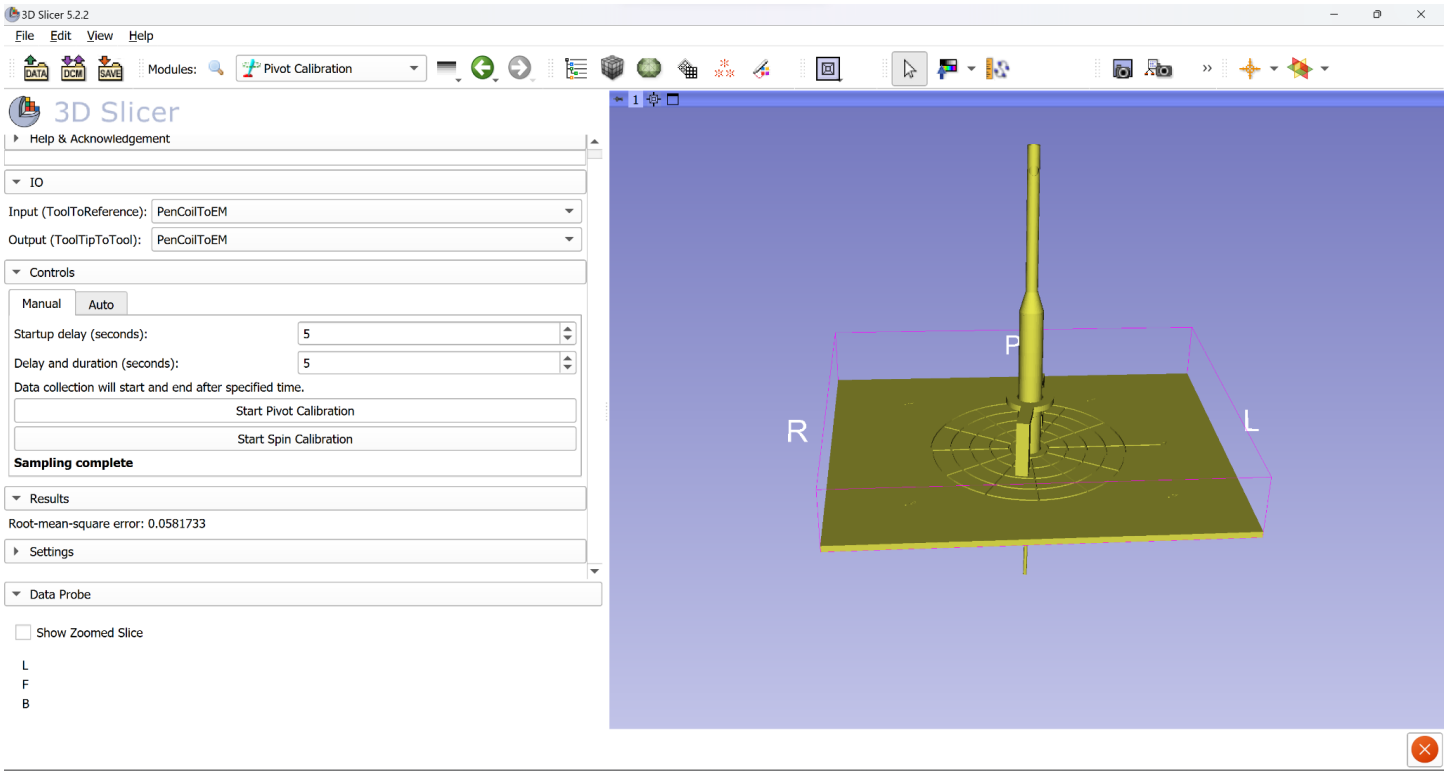
9. Add Connector IO



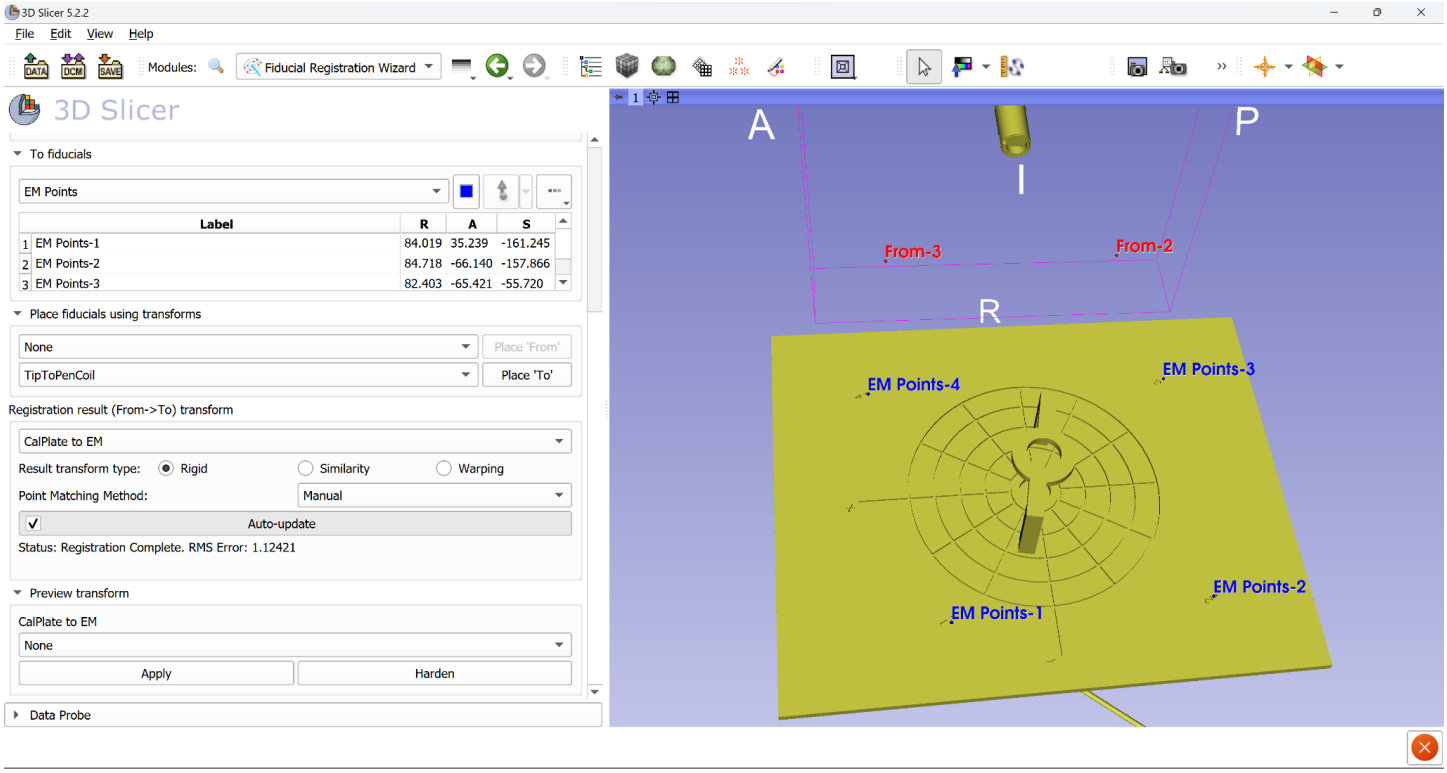

10. Go to **IGT → Pivot Calibration**



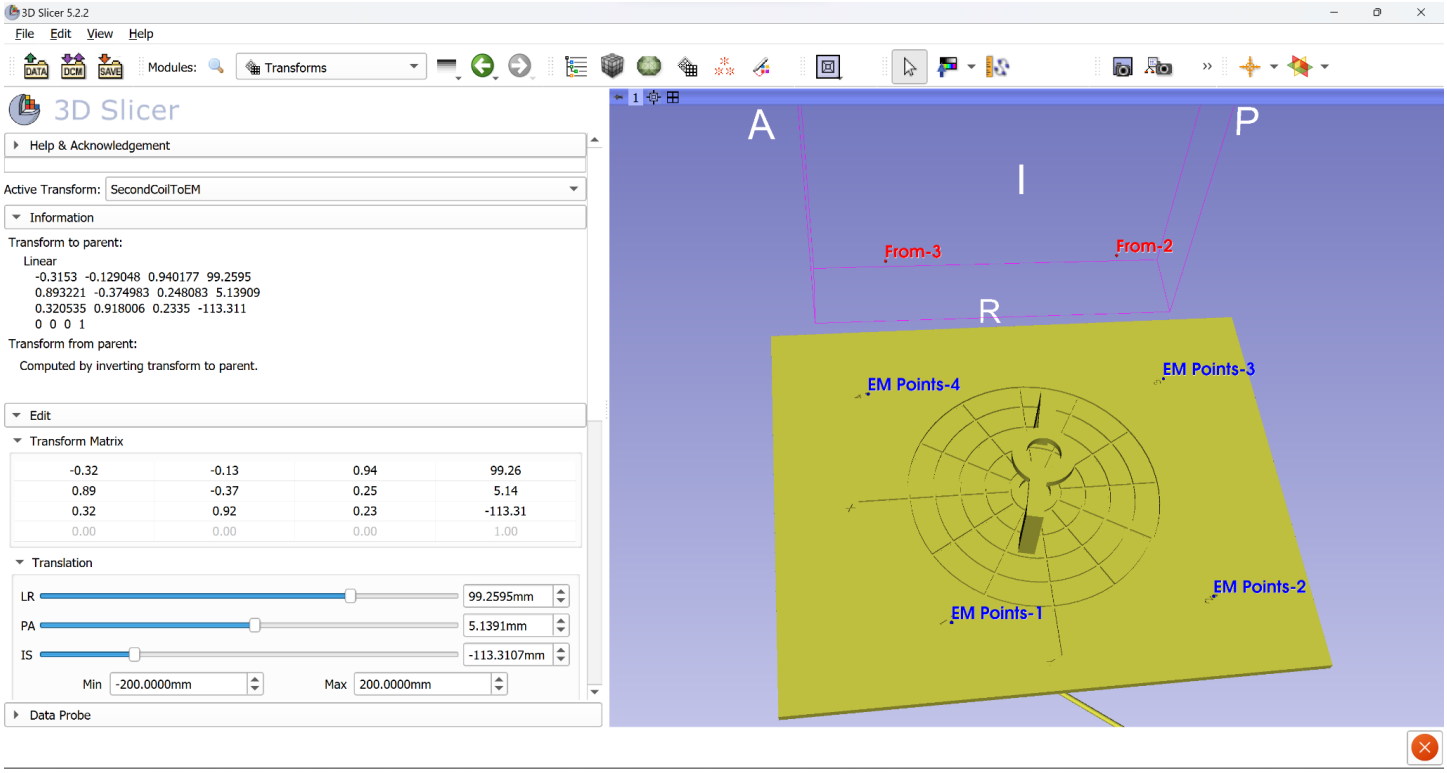
11. Set Input and Output to *PenCoilToEM*




12. Place the Pen Coil on a point on the calibration plate
13. Click **Start Pivot Calibration**
14. Pivot the pen steadily multiple times.
15. Redo until RMS <= 0.1
16. Go to **IGT → Fiducial Registration Wizard**



17. Mark the STL File at each of the four points
18. Place the pen in each of the four points marked
19. RMS <= .5 is acceptable
20. Place the probe in the calibration plate
21. Output the transformation matrix for SecondCoilToEM and CalPlate To EM




22. Create a new transformation called PCBtoSecondCoil
23. In MATLAB, calculate the PCBtoSecondCoil matrix from:

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T_plate_to_coil = inv(T_coil_to_em)*T_plate_to_em;
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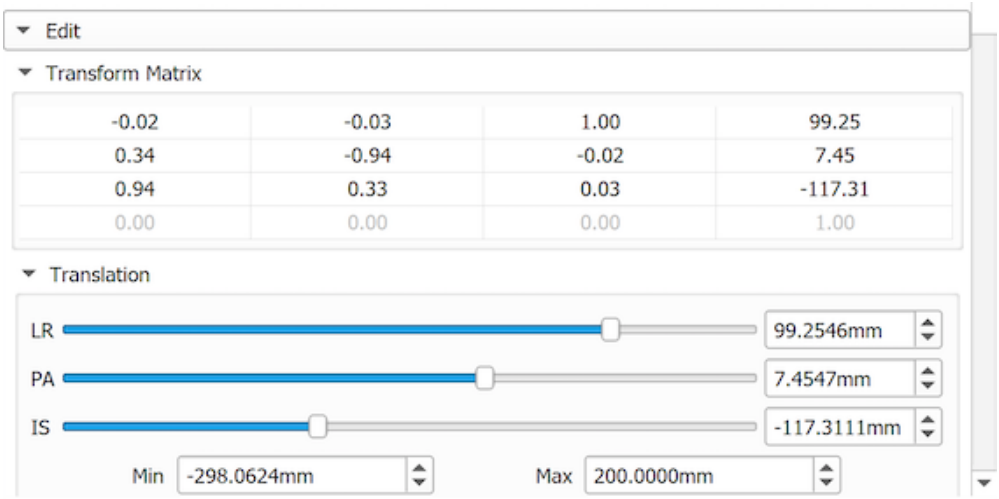
24. Copy the MATLAB output and edit PCBtoSecondCoil transformation to be the MATLAB output



25. The final transformation hierarchy should be as such: