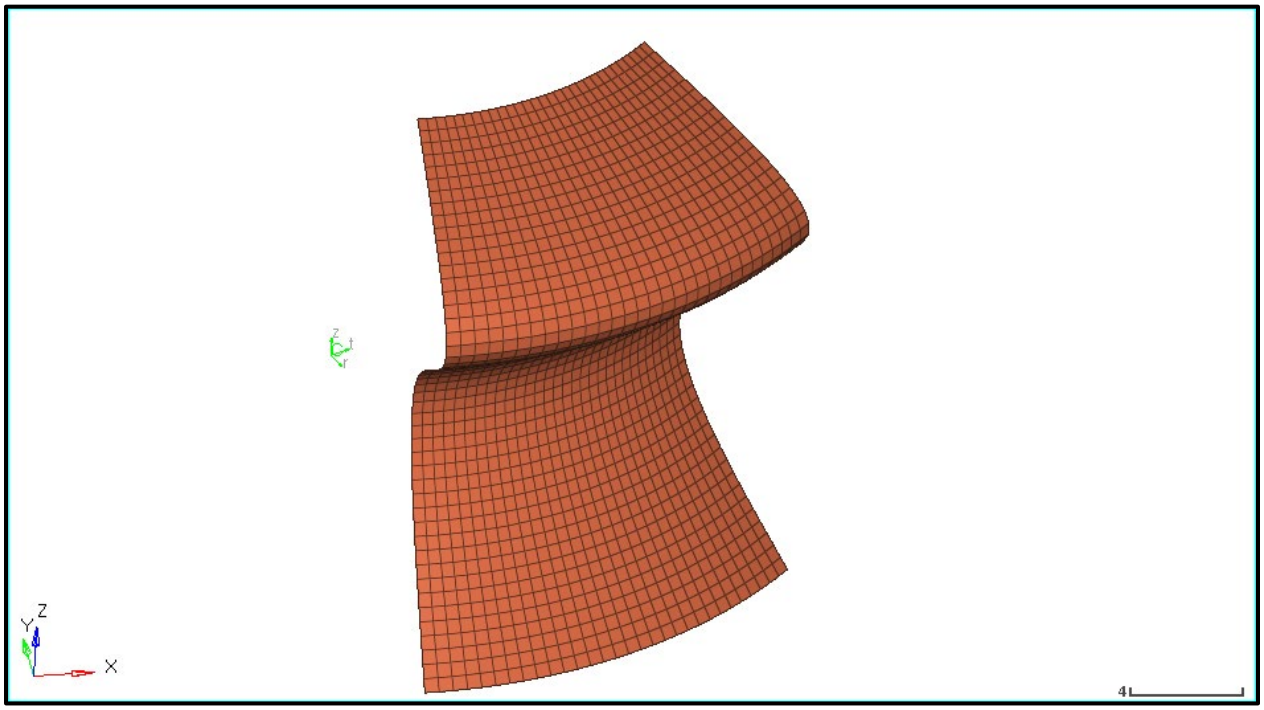
Exercise 4A: Using Kinematic Draping

This exercise introduces the user to the use of the Kinematic Draping in HyperMesh to solve for ply draping data.

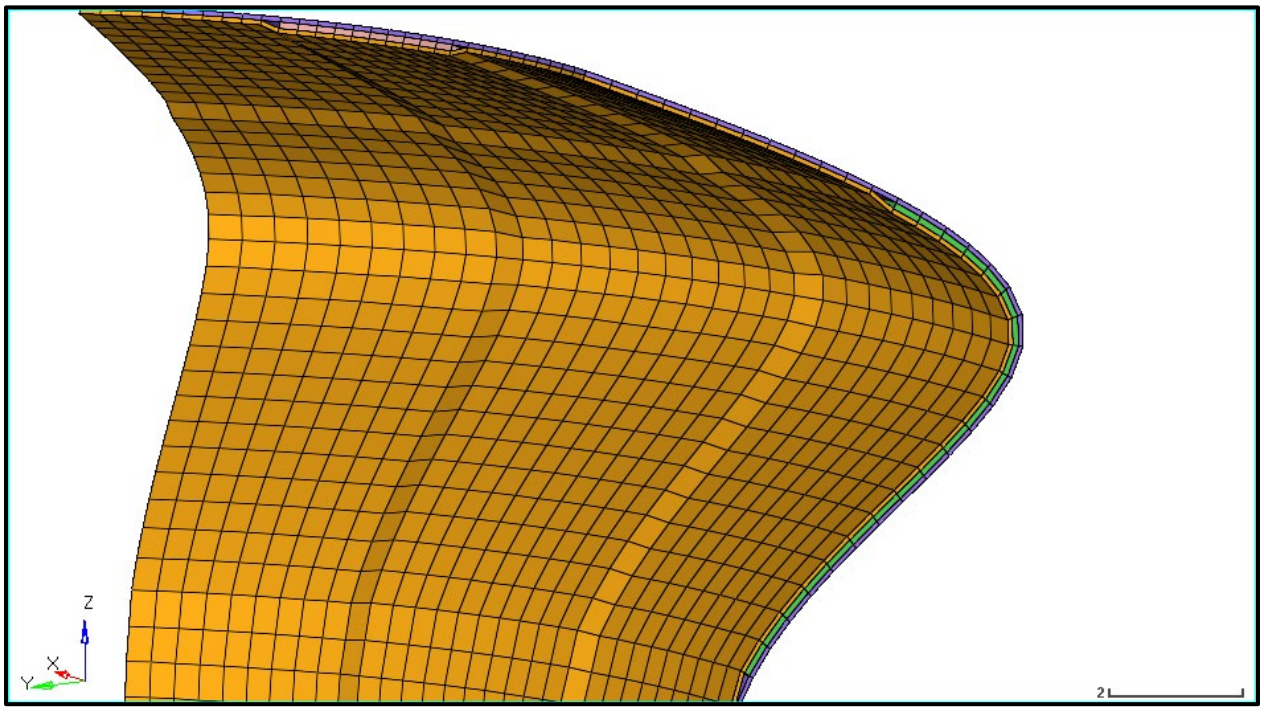


Problem Setup

You should copy the file: `geom.hm`

Step 1: Open the model in HyperMesh Desktop with the OptiStruct user profile

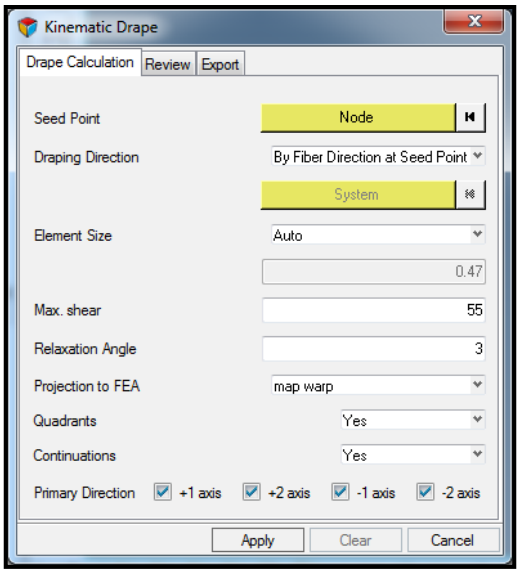
Step 2: Set composite visualization options for element color by prop, 2d detailed element representation, and composite layers and review the model



Step 3: Review the model's material orientation and confirm the orientation of each ply

Step 4: Use the kinematic draping tool to calculate the change in orientation of each element in every ply

1. Right-click on one of the **Plies** section of the **Model Browser** and select ***Drape*** **>** ***Kinematic Drape***.
2. In the **Kinematic Drape** dialog box, for ***Seed Point***, use the ***Node*** entity selector to select node `818` by using the `byid` extended selection option. Set the ***Draping Direction*** to `By Fiber Direction at Seed Point`. Leave the rest of the defaults.



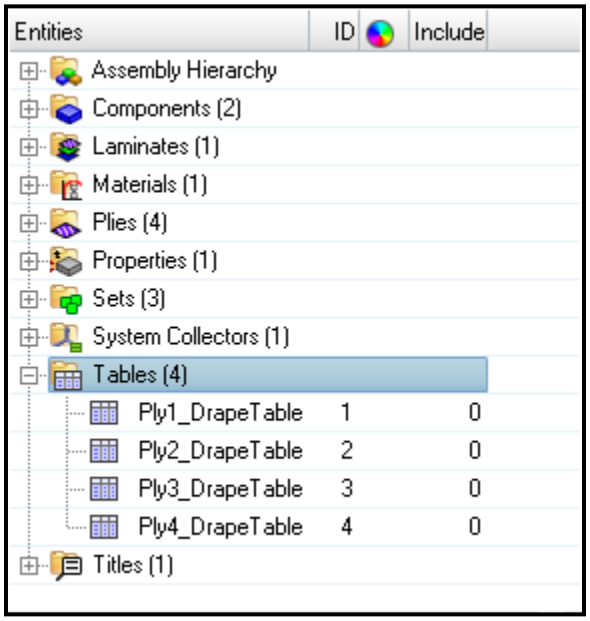
3. Click ***Apply*** to run the **Draping Simulation**.

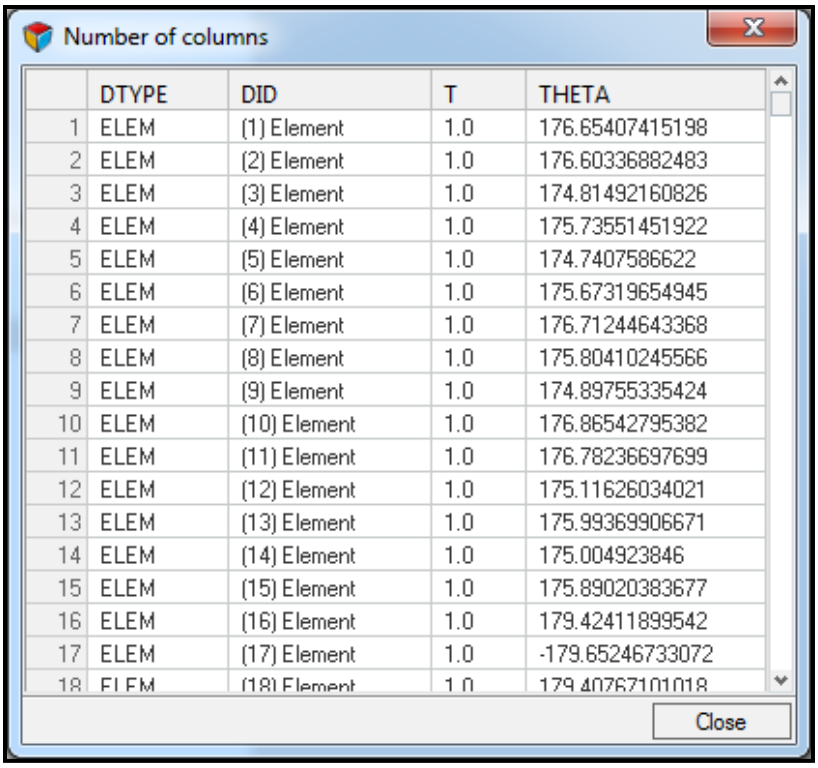
Tip: The **Kinematic Drape** tool calculates the drape angles associated with each ply based upon the seed point specified, which is contained within the boundaries of the plies being drape calculated.

4. Close the **Kinematic Drape** dialog box.
5. Repeat the process on all other plies

Step 5: Review the drape tables

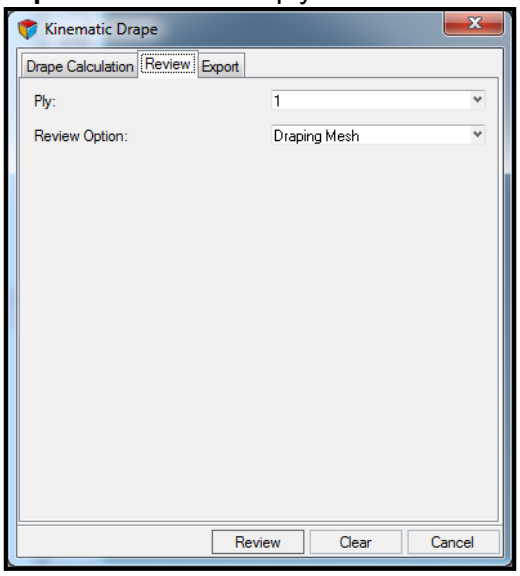
1. In the **Model Browser**, expand the **Tables** section.
2. The **Kinematic Drape** tool has created new drape tables containing the drape information for each element including thickness variation and angular correction.



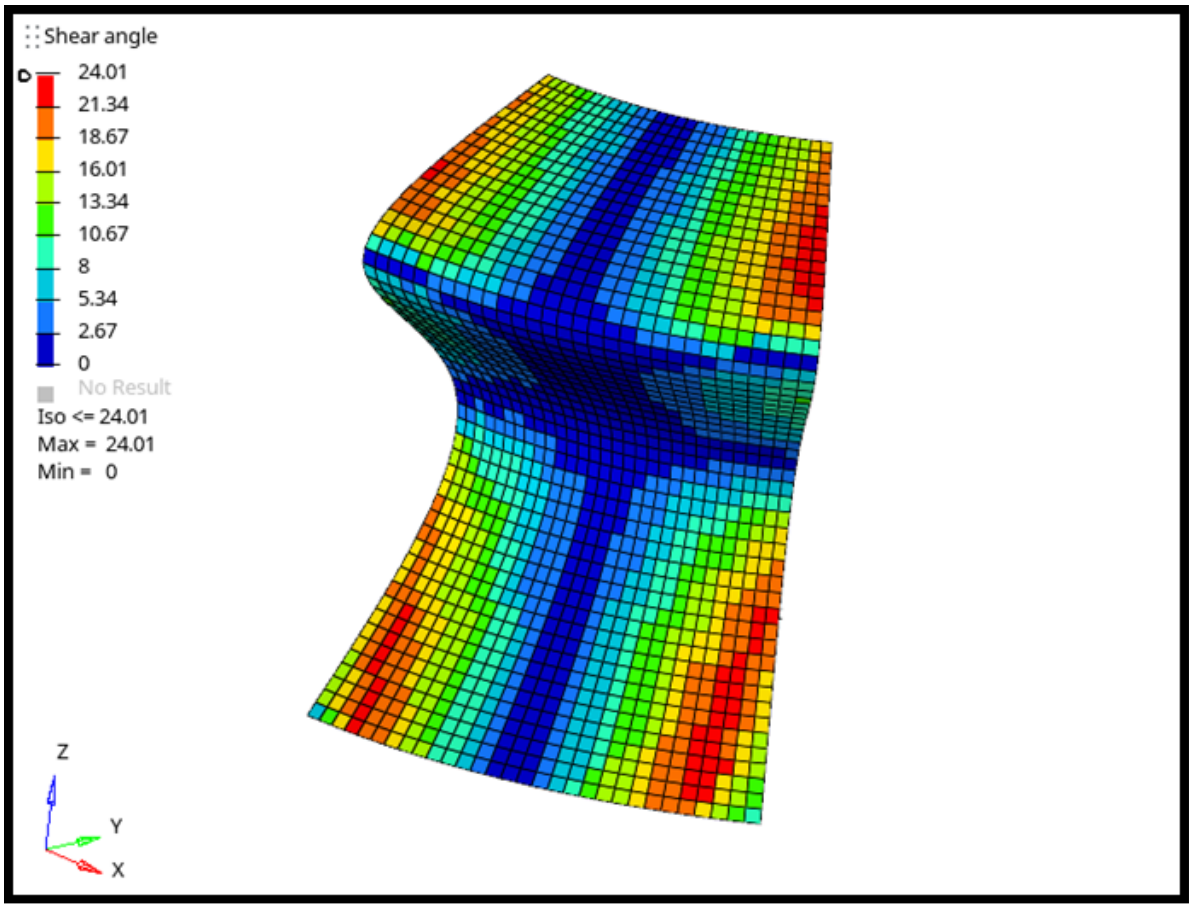


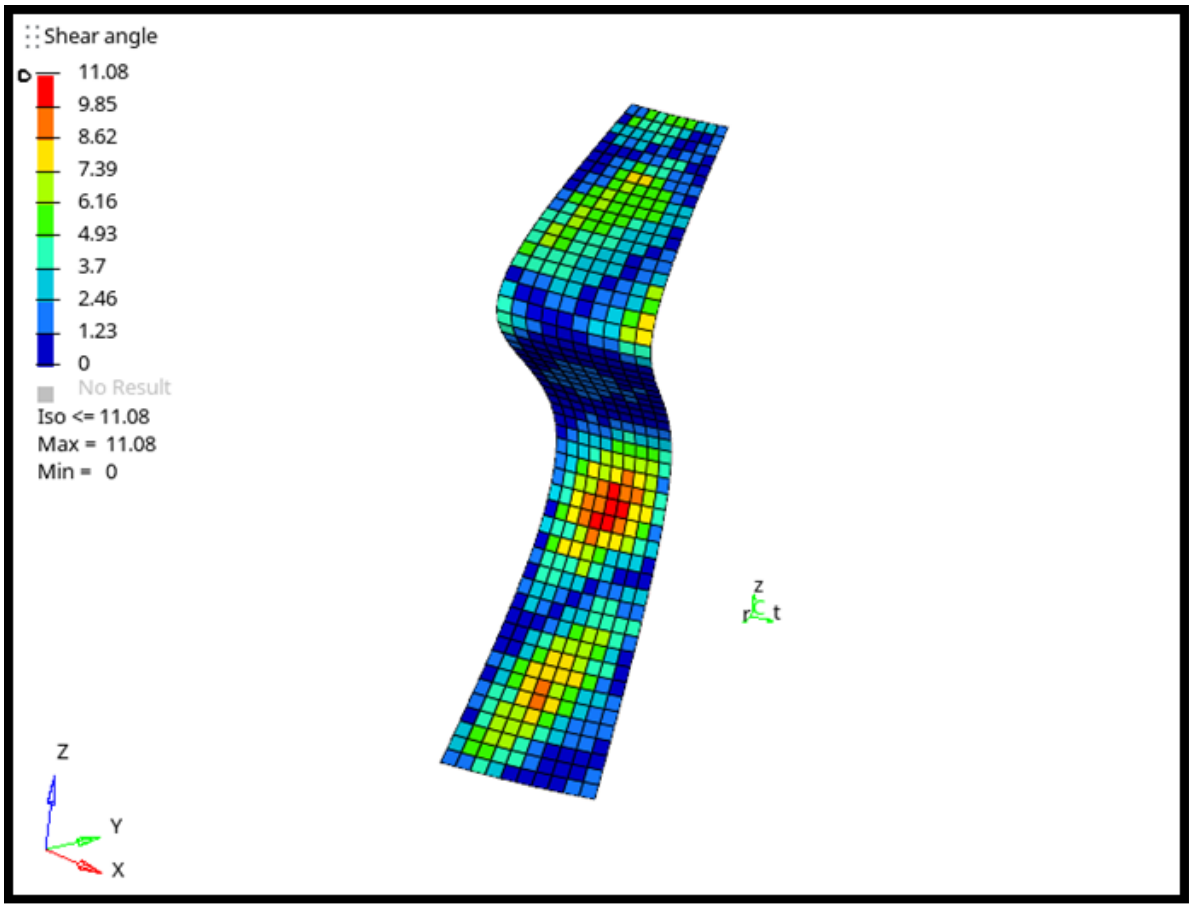
Step 6: Review the drape results visually using the Kinematic Drape tool

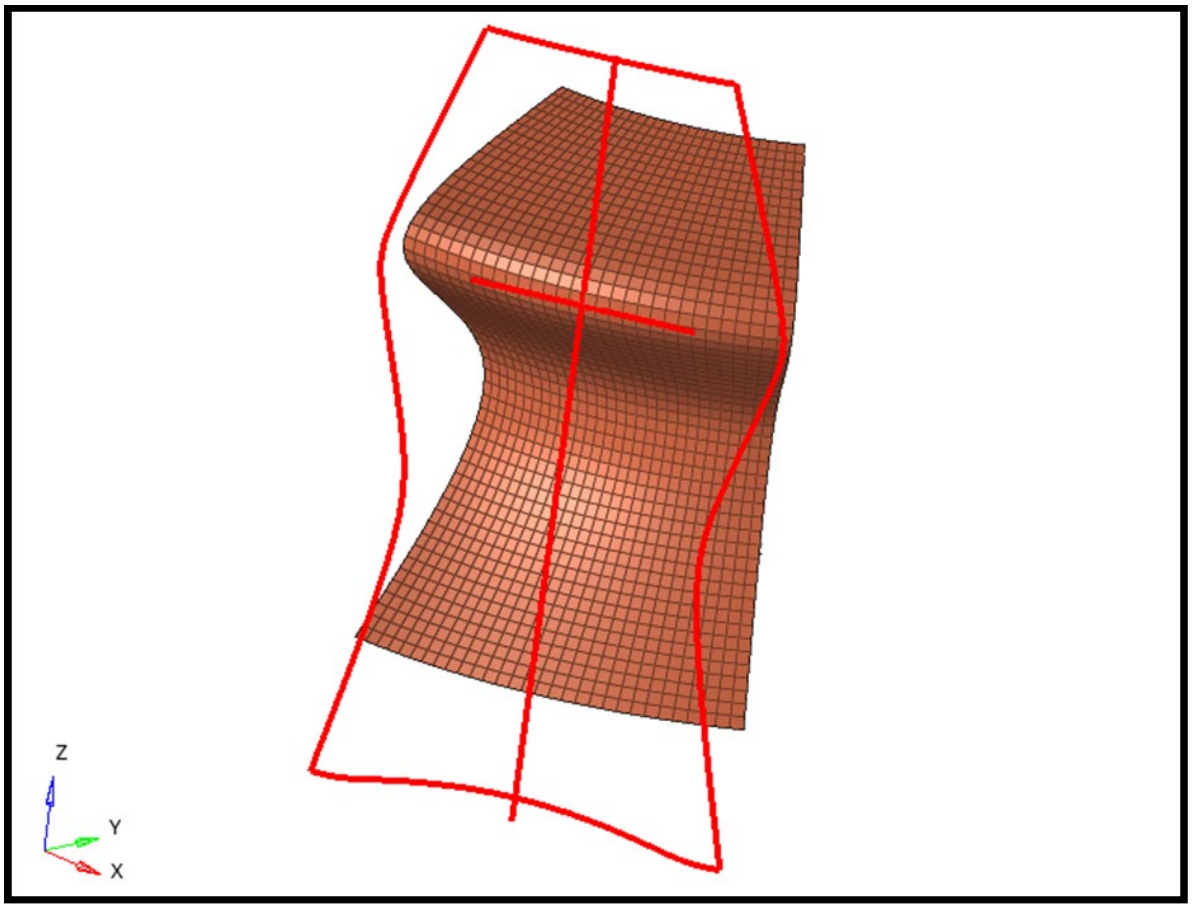
1. Re-open the **Kinematic Drape** tool on the first ply `1` and select the **Review** tab.



2. ***Ply*** is set to `1` and set the ***Review Option*** to `Draping Mesh` to review the manufacturing simulation mesh. Set the ***Review Option*** to `Shear` to visualize the shear angle distribution
3. Click ***Apply*** to overlay the thickness results directly onto the mesh in the graphics area.
4. Similarly, review the flat shape of Ply1 by setting ***Review Option*** to `Flat Pattern`.







Step 7: Save the model as `geom_drape.hm` and exit HyperMesh Desktop

EXERCISE RESULTS: `geom_drape.hm`