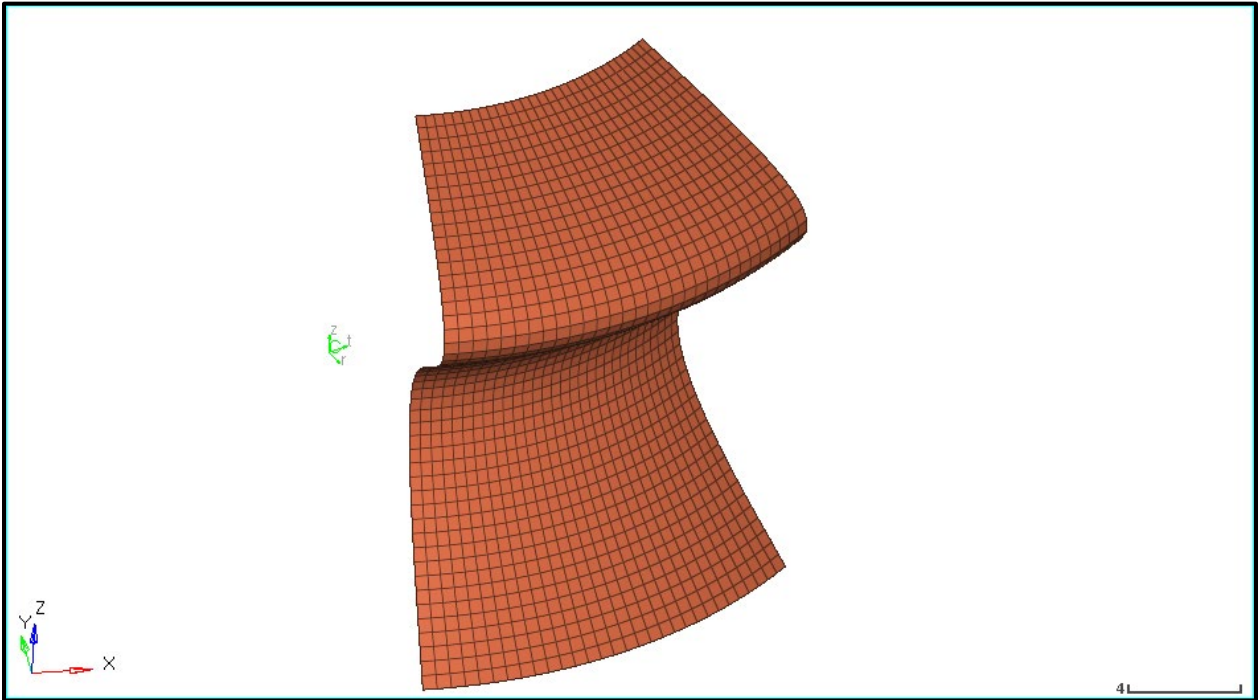


## Exercise 4A: Using Kinematic Draping

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

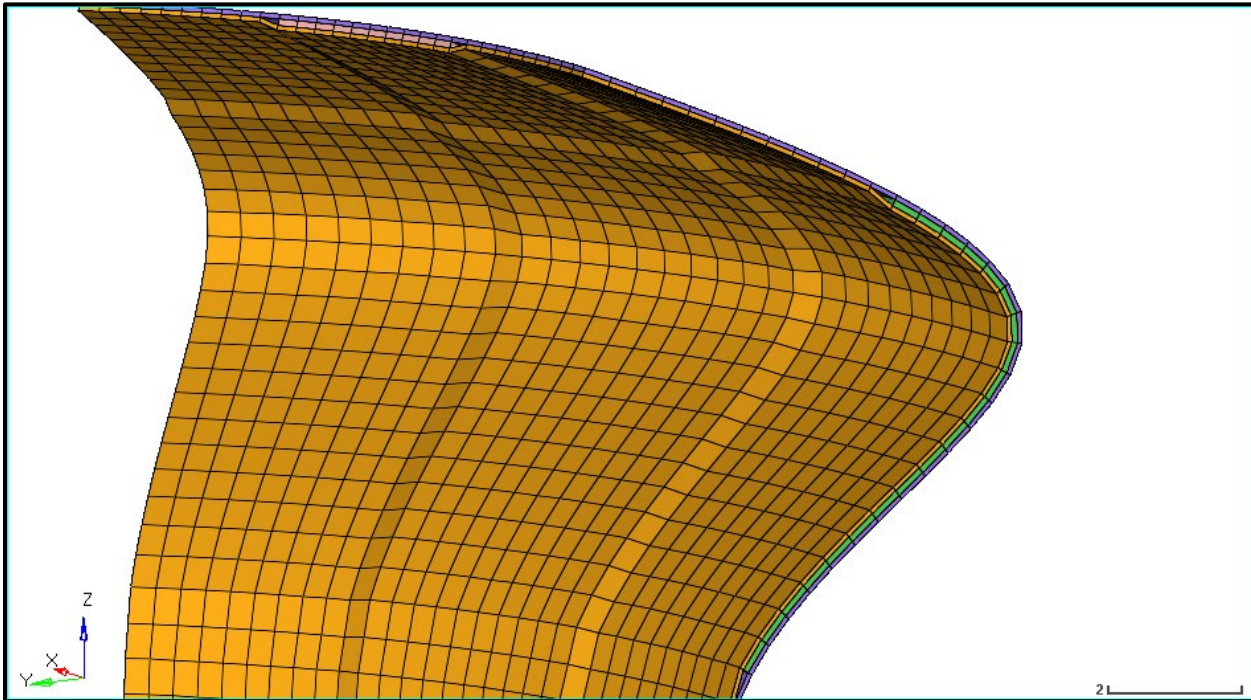


### Problem Setup

You should copy the file: `geom.hm`

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

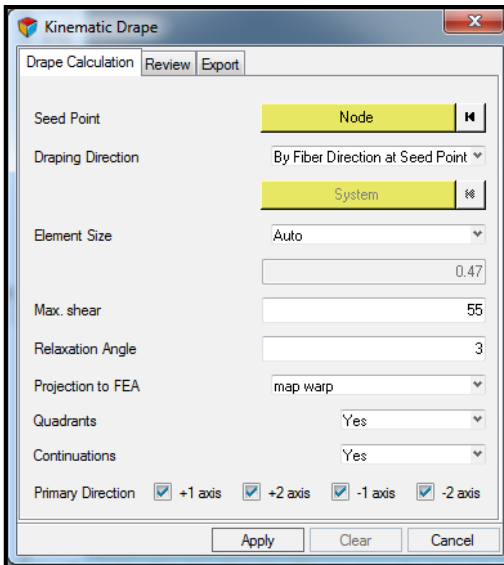
**Step 2: Set composite visualization options for element color by prop, 2d detailed element representation, and composite layers and review the model**



**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**.

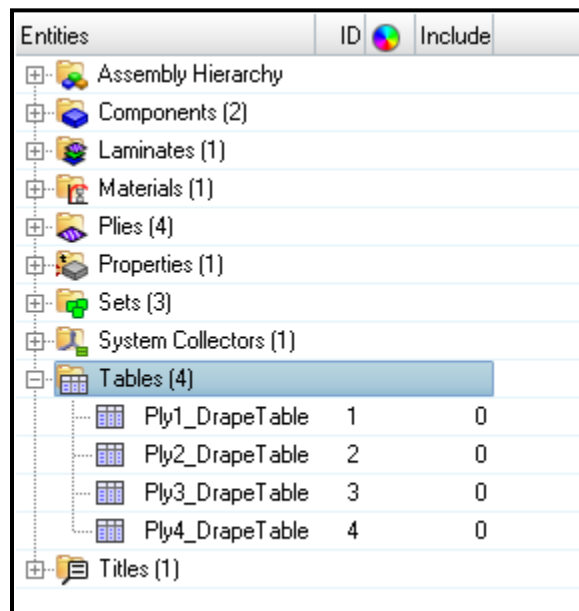
**Tip:** The **Kinematic Drape** tool calculates the drape angles associated with each ply based upon the seed point specified, which is contained within the boundaries of the plies being drape calculated.

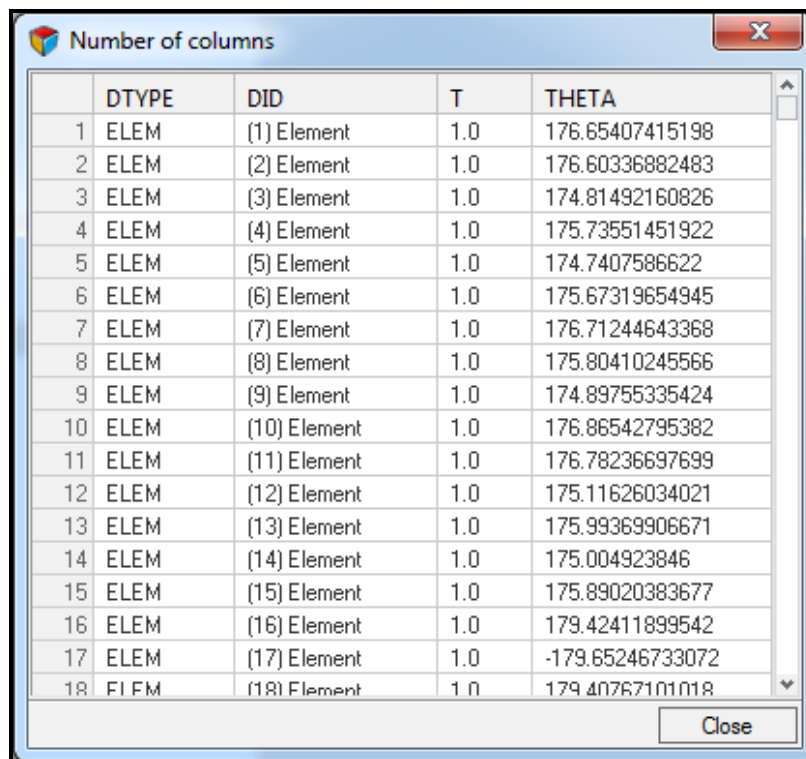
4. Close the **Kinematic Drape** dialog box.

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.

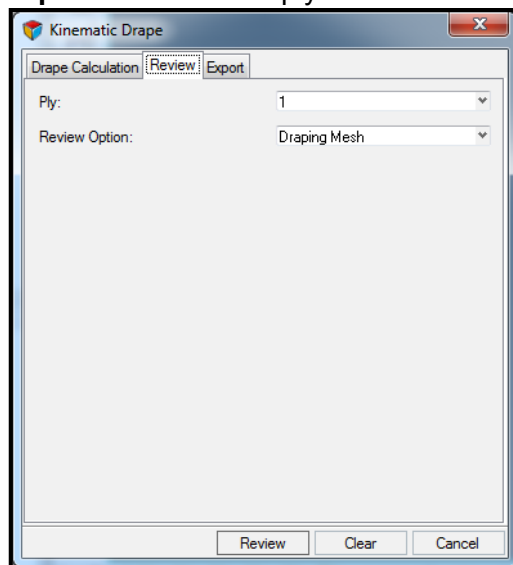




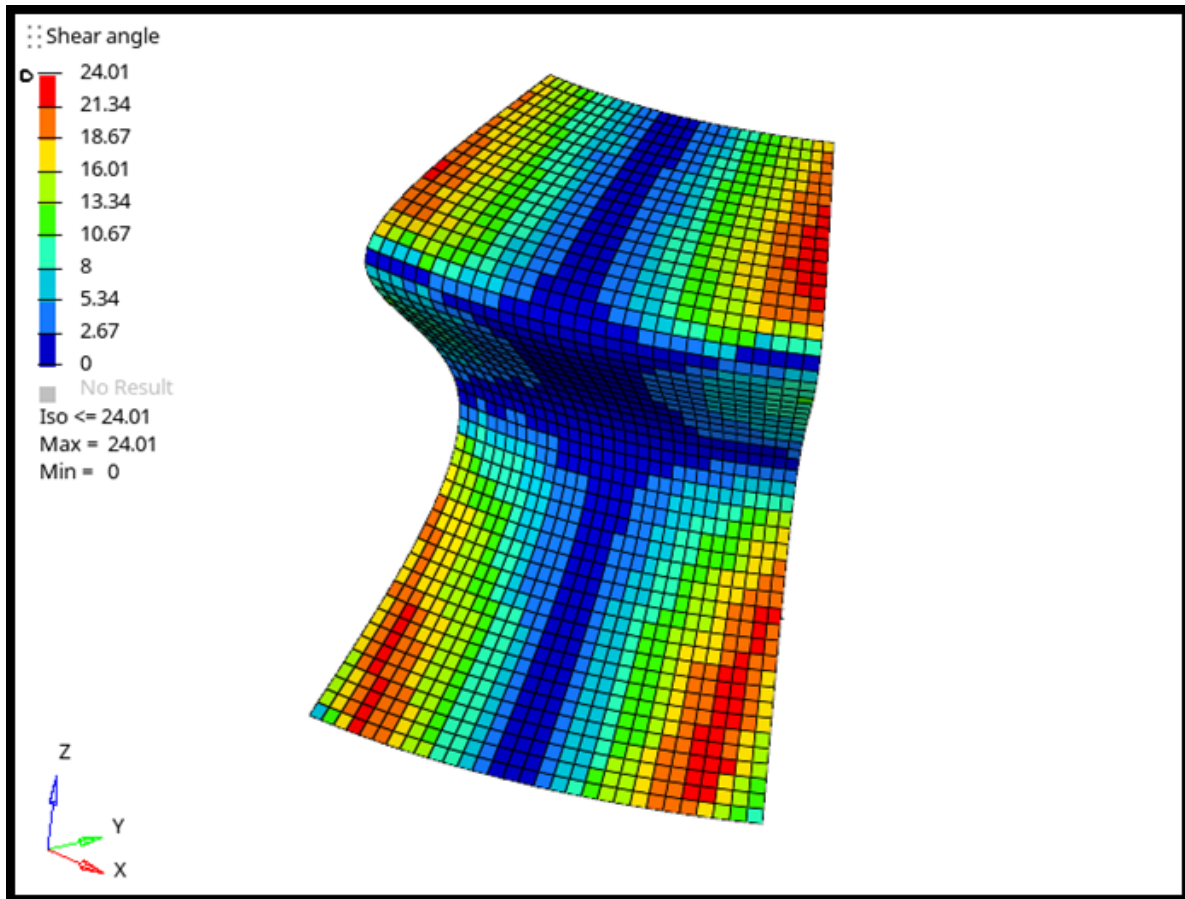
	DTYPE	DID	T	THETA
1	ELEM	(1) Element	1.0	176.65407415198
2	ELEM	(2) Element	1.0	176.60336882483
3	ELEM	(3) Element	1.0	174.81492160826
4	ELEM	(4) Element	1.0	175.73551451922
5	ELEM	(5) Element	1.0	174.7407586622
6	ELEM	(6) Element	1.0	175.67319654945
7	ELEM	(7) Element	1.0	176.71244643368
8	ELEM	(8) Element	1.0	175.80410245566
9	ELEM	(9) Element	1.0	174.89755335424
10	ELEM	(10) Element	1.0	176.86542795382
11	ELEM	(11) Element	1.0	176.78236697699
12	ELEM	(12) Element	1.0	175.11626034021
13	ELEM	(13) Element	1.0	175.99369906671
14	ELEM	(14) Element	1.0	175.004923846
15	ELEM	(15) Element	1.0	175.89020383677
16	ELEM	(16) Element	1.0	179.42411899542
17	ELEM	(17) Element	1.0	-179.65246733072
18	ELEM	(18) Element	1.0	179.40767101018

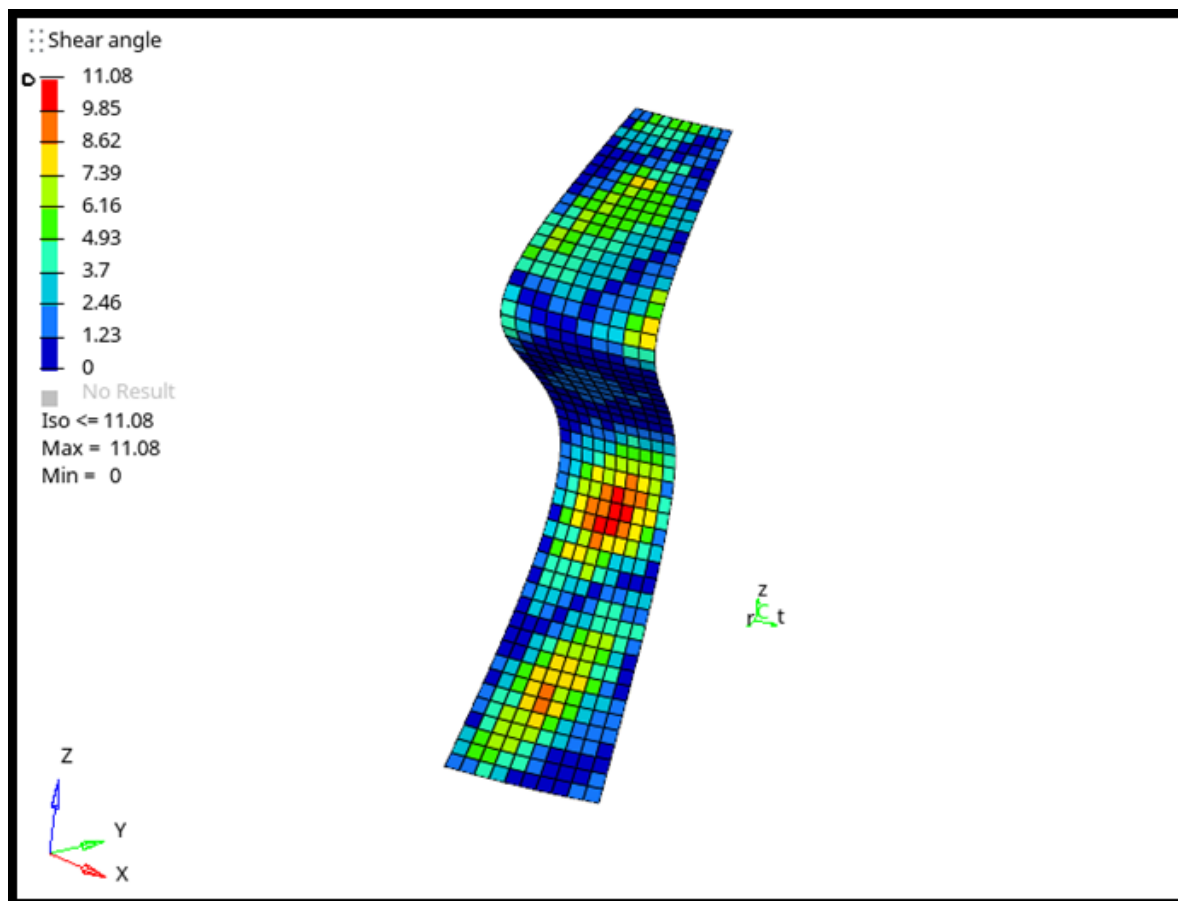
## Step 6: Review the drape results visually using the Kinematic Drape tool

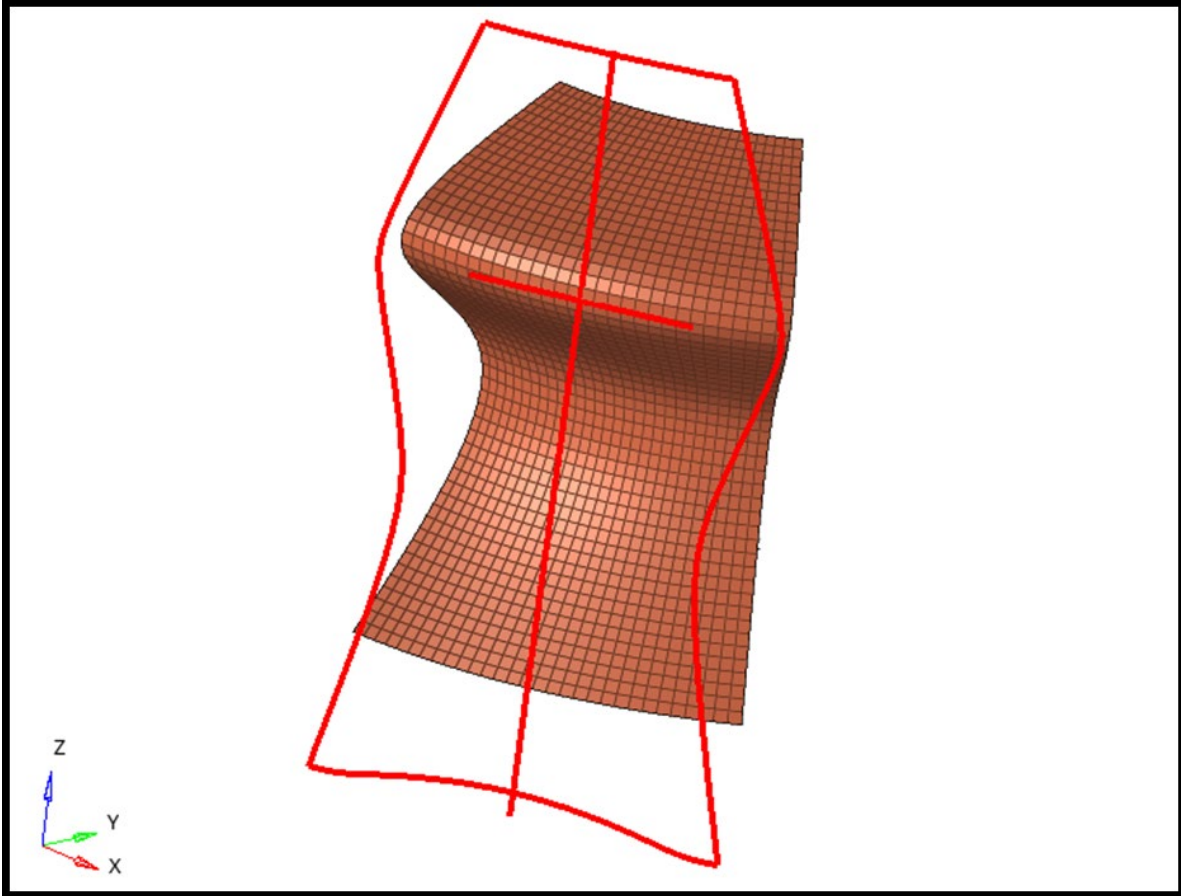
1. Re-open the **Kinematic Drape** tool on the first ply 1 and select the **Review** tab.



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`

