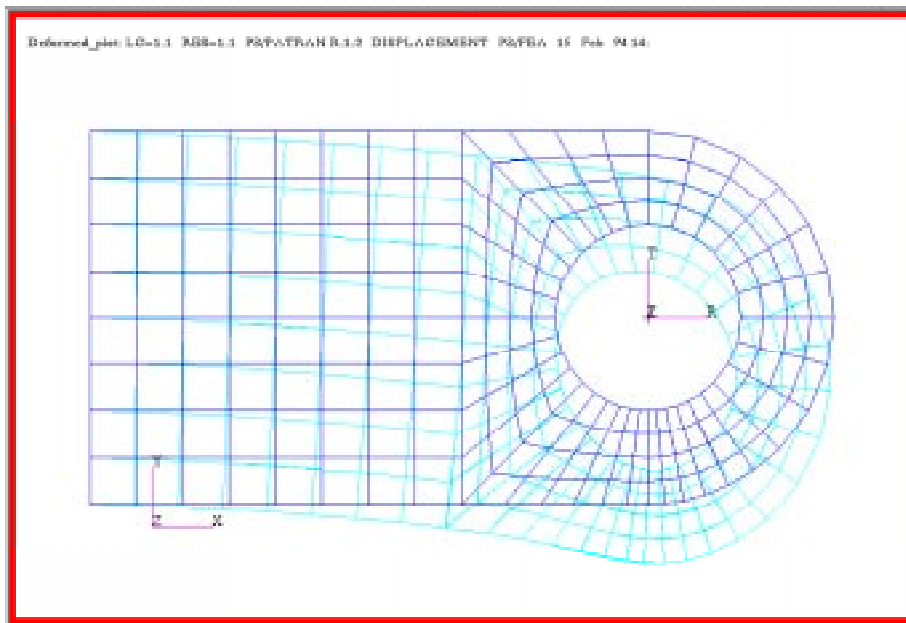

LESSON 9

Post Processing of Displacement Results



Objectives:

- Examine the deformation of the MSC/NASTRAN model to evaluate the validity of the assumptions made in the creation of the mesh density and selection of element type.
- Use the “Basic” and “Advanced” results post-processing forms.



Model Description:

In this exercise you will examine the analysis results of a clevis model, similar to the one you created during the previous labs, by rendering a variety of deformed shape plots of the model. In particular, you will create Deformed, Fringe, and Vector plots of the displacement.

Suggested Exercise Steps:

- Open **clevis.db**.
- Create a deformed shape plot of the **Displacement** result values.
- Turn off the undeformed plot of the clevis model. Change the orientation of the deformed image of the clevis model to an **Isometric view**. Render the deformed plot using a **Hidden Line** render style.
- Return to the **Default view** of the clevis model. Increase the *Deformation Scale Factor* to **0.25**.
- Produce a fringe plot of the displacement in the y-direction, (u_y). Render the plot with the element edges turned off.
- Produce a vector plot of the y-component of the displacements superimposed on the fringe plot of the clevis model. Change the render style of the clevis model to wire frame. Change the vector *Scale Factor* to **0.25** and use a **Model Scale Length**.
- Turn off the result vectors and the spectrum color bar in the viewport.

Exercise Procedure:

1. Open **clevis.db**.

File/Open...

Existing Database Name

clevis.db

OK

There are two approaches for post processing results in MSC/PATRAN. One approach is to use the multi-purpose (e.g. fringe, deformation, and animate) **Quick Plot** form. The other is to use response type specific forms, e.g. deformation.

These advanced forms, are designed to allow the user more flexibility on the manipulation and rendering of the model, however this requires more user input compared to the Quick Plot form.

2. Create a deformed shape plot of the **Displacement** result values.

◆ Results

Action:

Create

Object:

Quick Plot

Select Result Case(s)

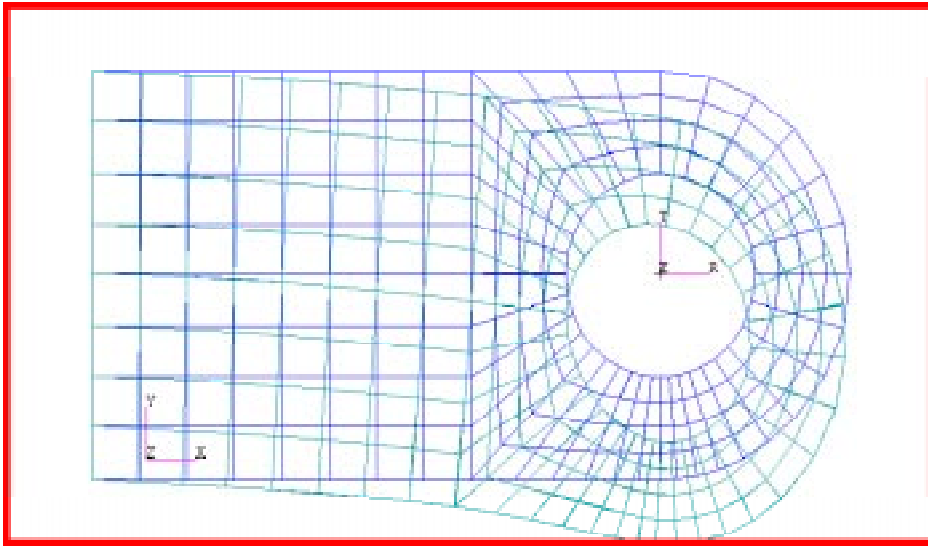
Load_Case.1.SC1

Select Deformation Result

Displacements, Translational

Apply

Your model should look like the one shown below.



3. Turn off the undeformed plot of the clevis model.

By default the deformed and undeformed plots are superimposed. Turn off the undeformed plot using **Create, Deformation, Display Attributes** under Results.

Action:

Create

Object:

Deformation

Select Result Case(s)

Load_Case.1.SC1

Select Deformation Result

Displacements, Translational

To change the **Display Attributes** click on the Display Attributes icon in the results form.



Show Undeformed

Apply

Change the *view* to **Iso 1 View** by clicking on this icon in the toolbar.



4. Return to the **Front** view of the clevis model, and increase the *Deformation Scale Factor* to **0.25**.

Click on the *Front View* icon from the toolbar.

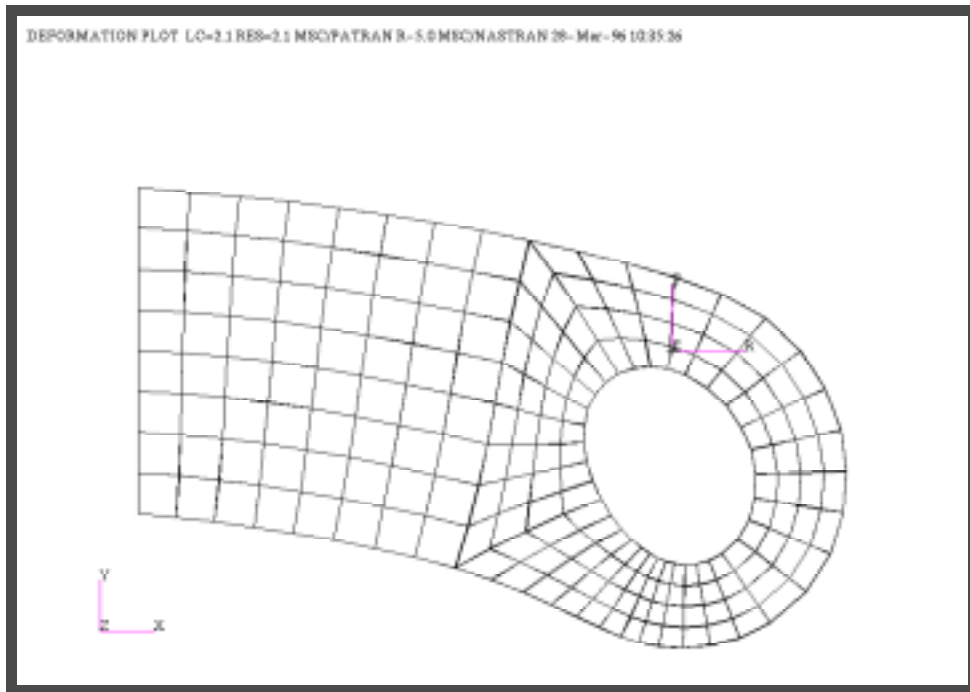


Scale Factor:

0.25

Apply

Your model should look like the one shown below.



Create a Fringe Plot

- Produce a fringe plot of the displacement in the y-direction, (u_y). Render the plot with the element edges turned off.

Object:

Select Result Cases

Select Fringe Result

Quantity

Select Deformation Result

Apply

Quick Plot

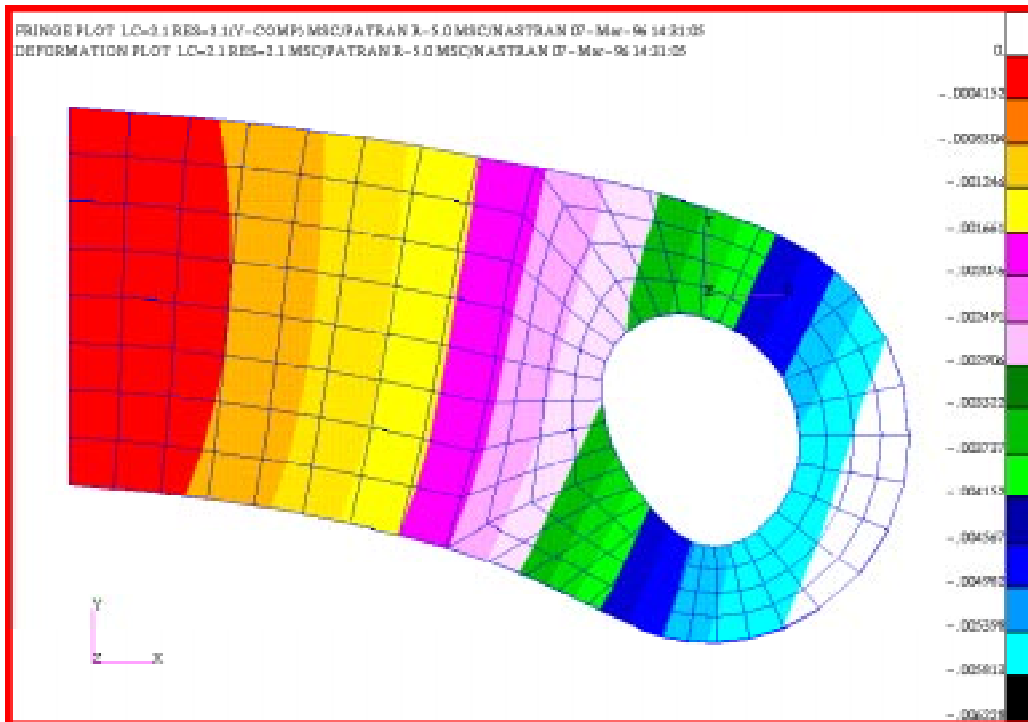
Load_Case.1.SC1

Displacements, Translational

Y-Component

Displacements, Translational

The fringe plot of the displacements is shown below.



Next, turn off the display of Finite Element Edges

Display/Shading ...

Edges

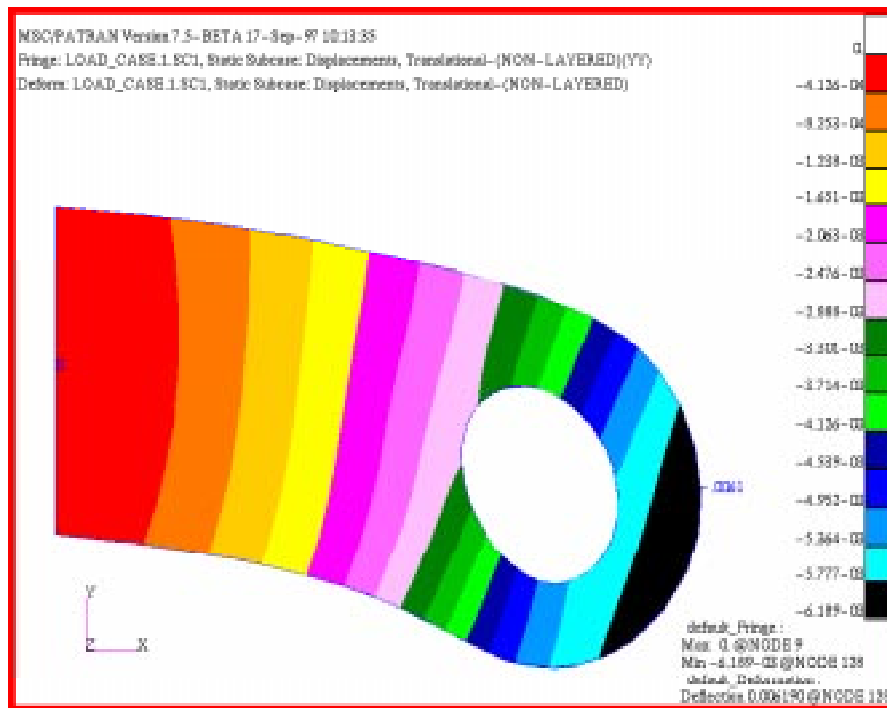
Show Edges

Apply

Cancel

**Turn off
Finite
Element
Edges**

With the Element edges turned off your model should look like the one shown below



Turn the element edge display back on before you start the next step

- Produce a vector plot of the y-component of the displacements superimposed on the fringe plot of the clevis model. Change the render style of the clevis model to **wireframe**. Change the vector *Scale Factor* to 0.25 and use a **Constant Scale Length**.

The Displacements can also be displayed as a vector plot. In order to use this option, you must first change the *Form Type Create, Marker*, in the *Results* form.

<i>Action:</i>	<input type="button" value="Create"/>
<i>Object:</i>	<input type="button" value="Marker"/>
<i>Method:</i>	<input type="button" value="Vector"/>
<i>Select Result Case(s)</i>	<input type="button" value="Load_Case.1.SC1"/>
<i>Show as</i>	<input type="button" value="Component"/>
	<input type="checkbox"/> XX <input checked="" type="checkbox"/> YY <input type="checkbox"/> ZZ
<input type="button" value="Apply"/>	

**Display a
Vector Plot**

Turn off the Fringe and Deformation plots you created in the previous step by changing the **Action** to **Post** and the **Object** to **Plots**. Select the vector plot in the Existing Plot Types databox,

<i>Action:</i>	Post
<i>Object:</i>	Plots
<i>Existing Plot Types:</i>	VEC_default_Vector
Apply	

7. Adjust the vectors attributes and scale.

<i>Action:</i>	Create
<i>Object:</i>	Marker
<i>Method:</i>	Vector
<i>Show as</i>	Component

Vector Attributes such as color, size, and magnitude scaling can be altered in the Results, Create, Marker, Vector form. Click the **Display Attributes** button, and then try changing the vector Scale Factor to 0.25 using a **Constant-Model Scaled Length**. Change view to **iso 1 view**.

8. Click on the Display Attributes.



Constant

Vector definition

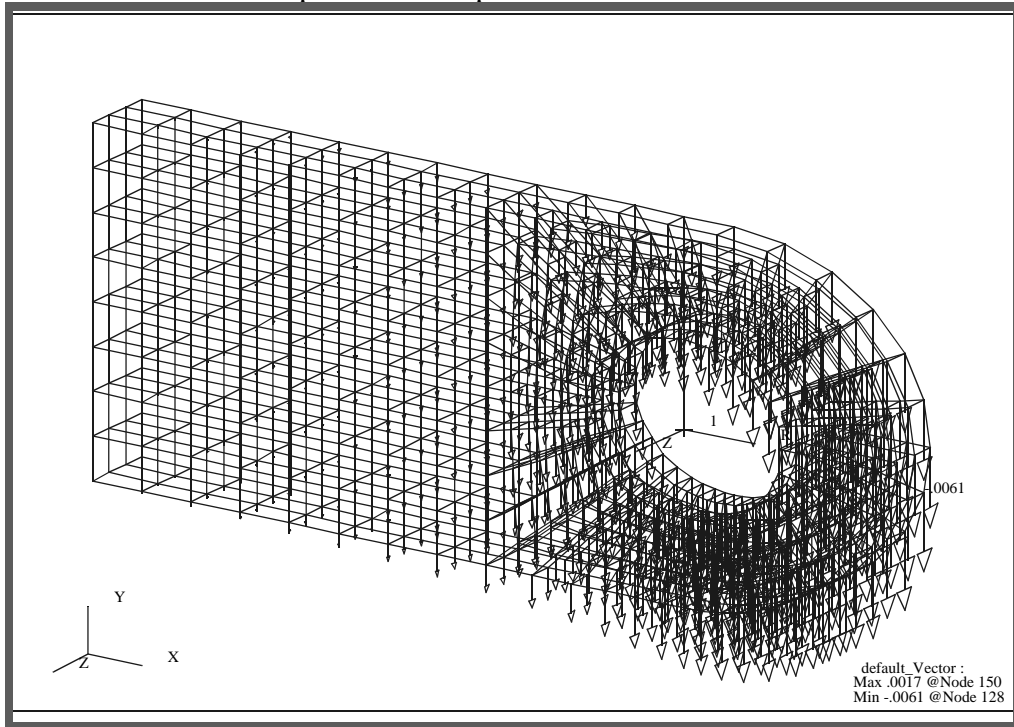
<i>Length:</i>	Model Scaled
<i>Anchor Style:</i>	

Show vector label

Show on deformed

Apply

The vector plot of the displacements is shown below.



**Turn off
Vector Plot**

Turn off the vector plot and post the deformed plot.

Action:

Post

Object:

Plots

Existing Plot Types:

DEF_default_Deformation

Apply

Do a simple 3D animation of the deformed shape.

Action:

Create

Object:

Quick Plot

Click on the Animation Options button.



Change the **Animate Method** to **Modal** and the Animation Graphics to **3D**.

Animate Deformation

Animation Method:

Modal

Animation Graphics

◆ 3D

Number of Frames

15

Apply

Select the Results Button

*Select Result Case(s)*

Load_Case.1.SC1

Select Deformation Result

Displacements, Translational

 Animate**Apply**

Try using the middle mouse button to rotate the model while it is animating. Hit **Stop Animation** when done.

This ends the lesson. **Close** the database and quit Patran.

File/Quit

