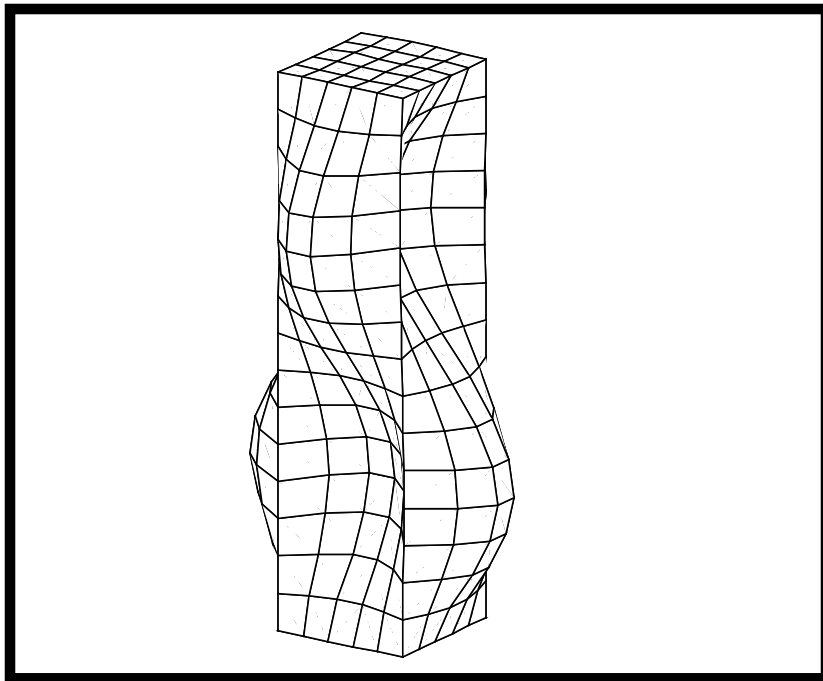


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## LESSON 20

# *Transient and Modal Animation*



### **Objectives:**

- Introduce the user to insight animation tools.
- Perform standard and quick modal animation.
- Perform transient animation.



## Model Description:

In this exercise you will examine the analysis results of a beam model by creating deformed shape plots. You will perform a simple modal animation as well as transient animation with respect to ten calculated mode shapes of a tower.

## Suggested Exercise Steps:

- Create a new database and name it **Mod\_insight**.
- Set *New Model Preference tolerance* to **Default** and set the *analysis code* to **MSC/NASTRAN**.
- Import the Neutral file **animation.out**.
- Use **Display/Entity Color/Label/Render** to turn off all entity labels.
- Use **View/Named View Options** to select the **isometric view**.
- Read in the results from an MSC/NASTRAN normal mode analysis. The results can be found in **Normal\_modes.op2** file.
- In **Insight**, create a deformation tool of the first modal frequency. Use **Preferences/Insight** to select a wireframe display of the model.
- Enable this deformation tool for sinusoidal animation with **10** frames.
- Unpost the tool using **Insight Control/Post/Unpost Tools**. Create a quick modal animation tool for the fifth mode.
- Unpost the second deformation tool.
- Create a transient animation of all modes with respect to the global variable frequency.
- Unpost the tool.

---

## Exercise Procedure:

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### Open a New Database

1. Create a new database. Set the new model preferences by choosing the geometric tolerance and the analysis code and type.

Open a new database and call it **Mod\_insight**.

#### File/New...

*New Database Name:*

**Mod\_insight**

**OK**

In the New Model Preferences form set the geometric tolerance to default, which is .005 units. Set the analysis to MSC/NASTRAN-structural.

*Tolerance:*

◆ **Default**

*Analysis Code:*

**MSC/NASTRAN**

*Analysis Type:*

**Structural**

**OK**

---

### Import a Neutral file

2. The finite element model along with the geometry will be imported from a PATRAN 2 neutral file, **animation.out**.

#### File/Import...

*Object:*

**Model**

*Source:*

**Neutral**

*Import File:*

**animation.out**

**Apply**

A summary that includes information such as the date the neutral file was originated and a path are displayed in a message window. To continue respond with affirmative.

Question from  
application  
NEUTOLD

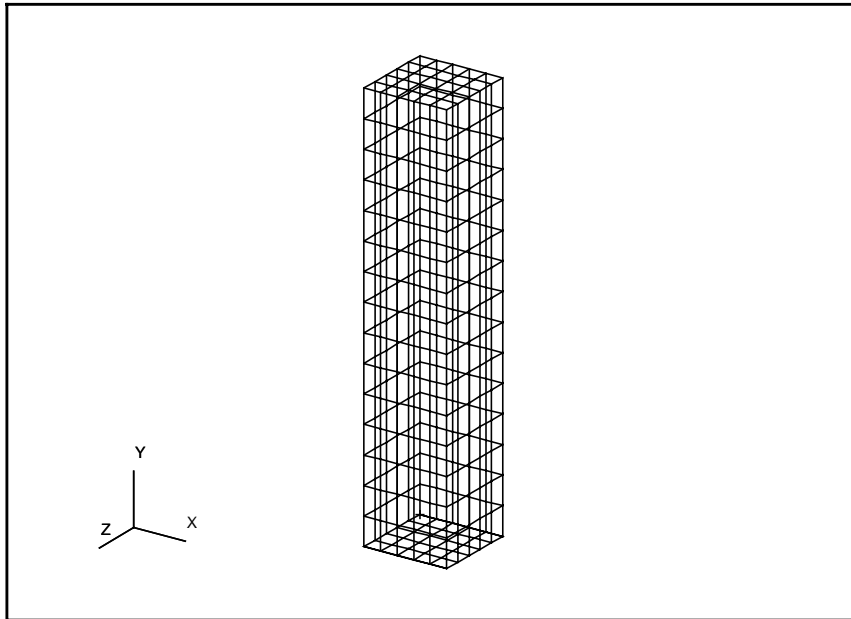
**Yes**

3. Modify the display of the model by orienting the model in an isometric view.

Change the view to isometric by selecting the Iso 1 view.



The model should now look like the one below.



4. A normal modes analysis has been performed on the tower using MSC/NASTRAN solution 103. The results from this analysis is available in an OP2 file.

Read in the normal modes from `Normal_modes.op2`.

◆ **Analysis**

Action:

Read Output2

Object:

Result Entities

Method:

Translate

Select Results File...

Selected Results File:

Normal\_modes.op2

OK

---

## Create Deformation Tool

Apply

5. Create an insight deformation tool. The deformation tool will be later used to perform the modal animation. This step is part of the standard approach to performing animation of results, essentially, modal animation.

Create a deformation tool of the first frequency.

### ◆ Insight

Action:

Create

Tool:

Deformation

Results Selection...

Current Load Case(s):

4.1-DEFAULT, Mode 1: Frequency = 938.732

Update Results

Deformation Result:

2.1-Eigenvectors,Translational

OK

Apply

6. Change the appearance of the model by changing its render style to wireframe. This step is rather a matter of taste.

### Preferences/Insight

Display Method:

Wireframe

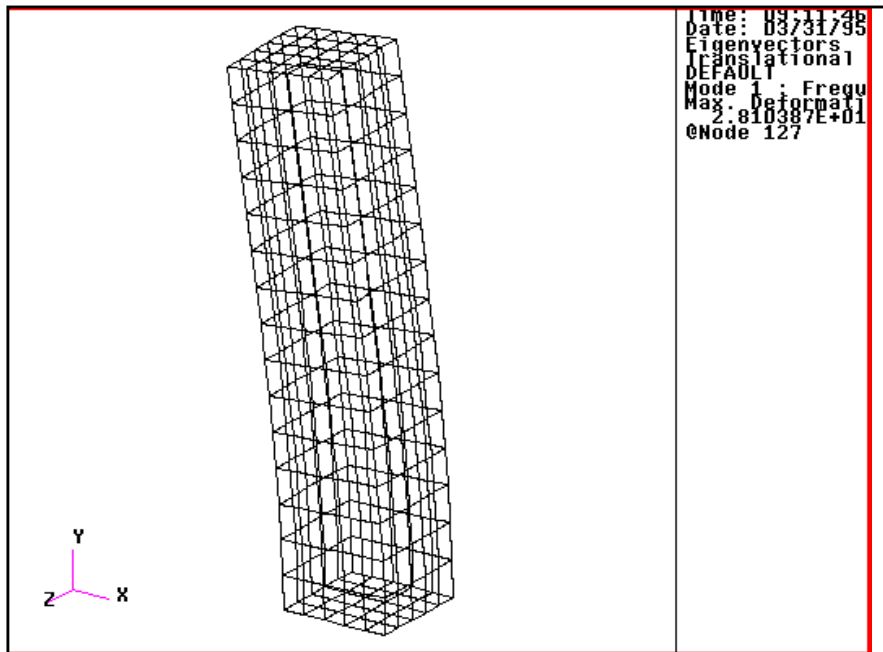
Apply

Cancel

---

## Display Preferences

The model should now look like the one below



- In order to be able to animate insight tools, the tools must be prepared for this purpose. This is done by setting the animation attributes such that the animation is enabled.

**Enable Animation**

It is more common to set the animation attributes during the tool creation stage in the results selection form. However, for the sake of clarity, it has been done in a separate step for this exercise.

Now enable the animation for the tool previously created. To select the deformation tool **DF-Deform\_1** you need to highlight its name in the *Non-Animation Tools* list box. The sinusoid animation performs the animation based on the calculated mode shape multiplied by a sine function that varies between 1 and -1.

**Insight Control/Animation Control...**

Setup...

Animation mode:

Animate Tools - 3D

Non-Animation Tool(s):

DF-Deform\_1

Animation Attributes:

Enable Animation

Animation Type:

Sinusoid

OK

---

The animation is done based on carrying the simulation through 10 frames.

*Frames:*

10

**Animate**

The difference between the animation methods is that bounce will do the animation in a complete cycle (first frame through the last, then last back to first.) The cycle method will do the animation in one direction only. Try them both to feel the difference.

Note that the system's response depends on the platform and the networking arrangement. After pressing the pause switch, it may take a while for the system to respond. In the **Animation Control** form select

**Pause/Stop Animation**

*Animation Method:*

**Cycle**

*Animation Speed:*

Set the Slide bar to 50%

**Pause/Stop Animation**

8. Stop the animation and prepare for the next step.

In the **Animation Control** form clear the animation.

**Pause/Stop Animation**

**Clear**

*Question from Application INSIGHT:*

**Yes**

**OK**

Next, we will unpost the current tool.

**Insight Control/Post/Unpost Tools...**

In the Post/Unpost Tools form:

**Select None**

**Apply**

---

## Unpost Animation



9. A quick modal animation can be performed using a utility designed for this purpose.

In the previous step we did the modal animation using the standard procedure which involved creating a tool, setting up the animation details and performing the animation. Here, a modal animation tool will be created immediately.

## Modal Animation

**Insight Control/Modal Animation...**

**Results Selection...**

In the **Results Selection** form, select the fifth mode.

*Current Load Case(s)*

**4.5-DEFAULT, Mode 5: Frequency = 4153.65**

**Update Results**

*Deformation Result*

**2.1-Eigenvectors, Translational**

**OK**

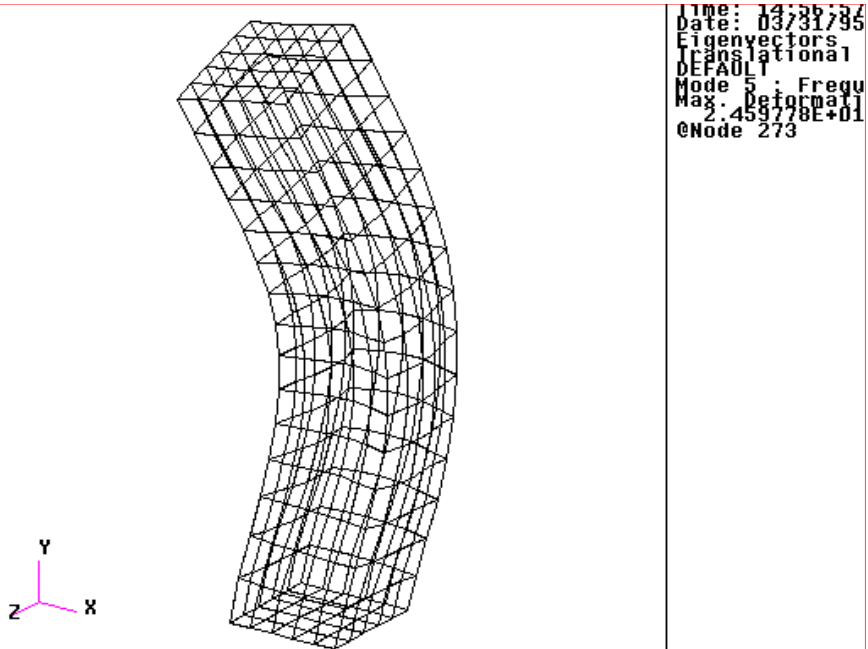
*Animate mode:*

◆ 3D

**Animate**

MSC/PATRAN will then display the animation.

The 2D animation mode displays the animation only in the plane it was created in. In contrast, the 3D animation mode allows the rotation of the model, using the middle mouse button, to view the animation from different view point.



## Unpost Tool

10. Clear the animation and unpost the animation tool from display.

Press **Cancel** in the *Modal Animation* form. Also, you may unpost the animation tool just created.

In the Post/Unpost Tools form:

Select None
Apply
Cancel

11. Next, we will perform transient animation with respect to the calculated natural frequencies of the system.

Transient animation can be performed with respect to global variables defined in MSC/PATRAN. Time, frequency and load cases are examples of these global variables.

When selecting the modes in the current load cases databox, one needs to highlight all modes that will be part of the animation. The global variable at which the animation is done with respect to is the frequency.

Action:

Create
--------

## Transient Animation Setup

Tool:

Deformation

Results Selection...

On the *Results Selection* form:

Current Load Case(s):

Select all 10 Modes

Update Results

Deformation Result:

2.1 Eigenvectors, Translational

Animation Attributes

In the *Animation Attributes* form:

Enable Animation

Animation Type:

Global Variable

Global Variable:

Frequency

OK

In the Results Selection form:

OK

In the Insight Imaging form:

Apply

12. Start the transient animation.

Animation setups such as mode, number of frames and method can be set at this stage. After performing the instruction below, try to experiment with the setting to gain familiarity with this feature.

**Control  
Animation**

Insight Control/Animation Control...

Setup...

On the *Animation Setup* form:

Frames:

10

Animate



13. Stop the animation by un-posting the tool.

Refer to step 8 for details on how to clear the display and unpost the animation tool.

14. Terminate the session.

Stop insight by clicking on the insight radio button on the main menu.

Close database and quit MSC/PATRAN to complete this exercise.

**File/Quit**

---

**Unpost  
Animation**

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**Close  
Database**