ANSYS 6.0 Variable Viewer

New Variable Viewer to Review Time-History Data

New Time-History Commands

New XY-Plotting Graphing Options

Overview of 6.0 Enhancements

- **A number of enhancements for time-history postprocessing have been included at ANSYS 6.0:**
  - **At 5.7, the *Results Viewer* was introduced to simplify General Postprocessor operations with context-sensitive pop-up menus and a simplified interface.**
  - **At 6.0, the *Variable Viewer* was developed to simplify the Time-History Postprocessor procedure. This calculator-like interface provides most of the time-history functionality in a convenient GUI.**
  - **Time-History variables can now be stored for the current ANSYS session when the user leaves /POST26. In prior releases, the user-defined time-history variables would be erased if the user left the Time-History Postprocessor.**
    - **Command: KEEP**
    - **Menu: Main Menu > TimeHist Postpro > Settings > Data**

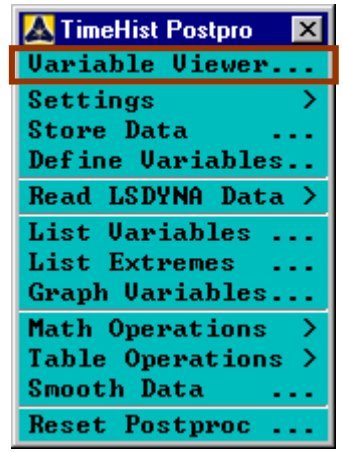
Overview of 6.0 Enhancements (cont'd)

- A new command allows users to retrieve *averaged* element data at a given node. Prior to this, users could only retreive *unaveraged* element solution data at a given node belonging to a specific element (ESOL command).
  - Command: ANSOL
  - Menu: Main Menu > TimeHist Postpro > Variable Viewer
- Names for time-history variables can now be up to 32 characters long for more descriptive names. In previous releases, an 8 character limit was imposed.
- The XY Plotting graphics options /GMARKER, /GTHK, and /GROPT have been enhanced to provide the user more control over time-history plots.

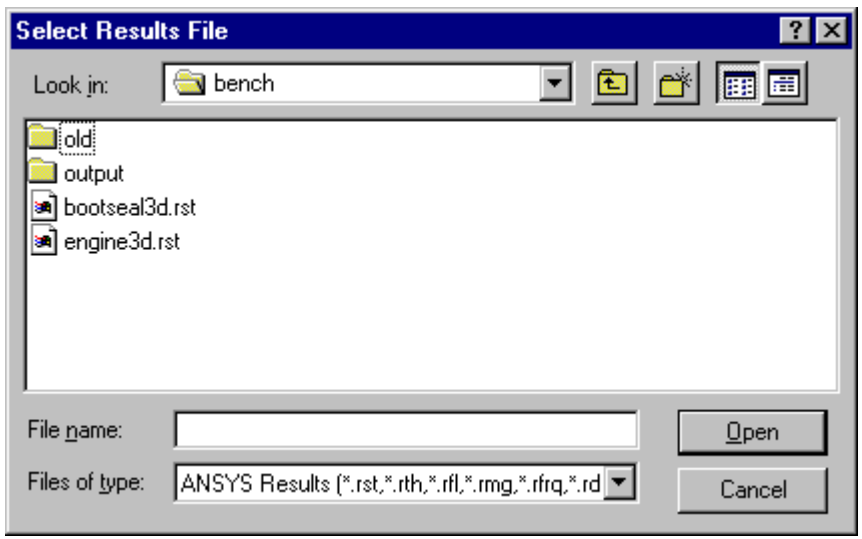
The Variable Viewer

Introduction

- **The Variable Viewer is invoked via**
  - **Main Menu > TimeHist Postpro > Variable Viewer…**



- **When first running the Variable Viewer, the user will be prompted to select a results file to review.**



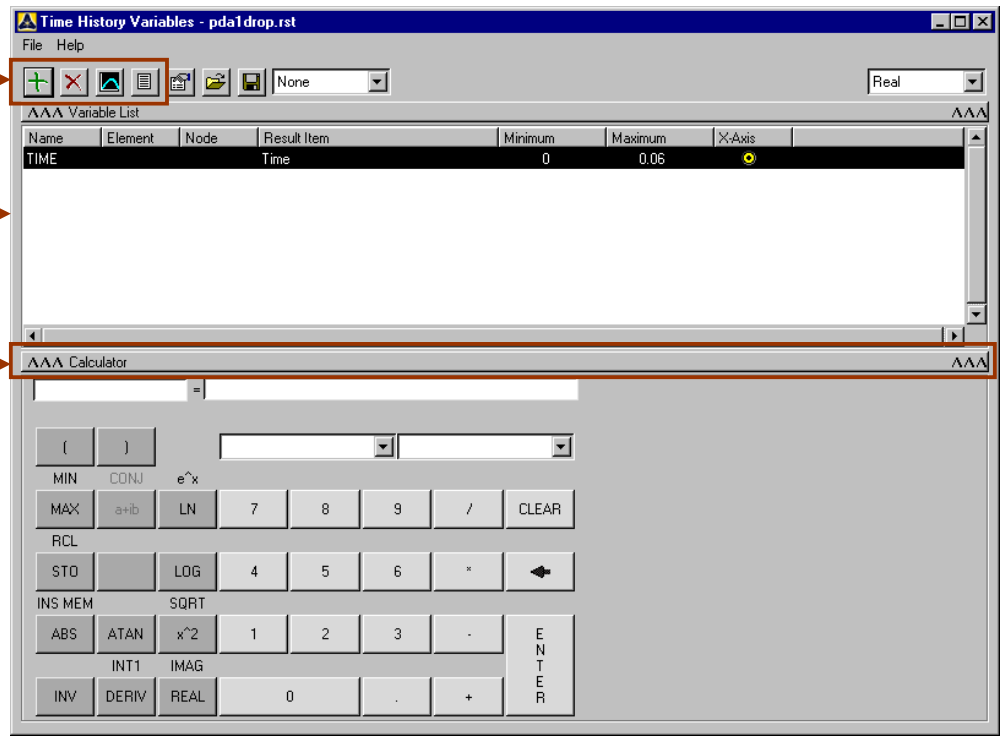
Overview of Interface

- **The Variable Viewer interface is quite simple, as shown below.**
  - **Additional details can be found in the ANSYS 6.0 Online Help, *Basic Analysis Guide,* Ch. 6.1 "The Time-History Variable Viewer"**

Add, Delete, Graph, and List Time-History Variables

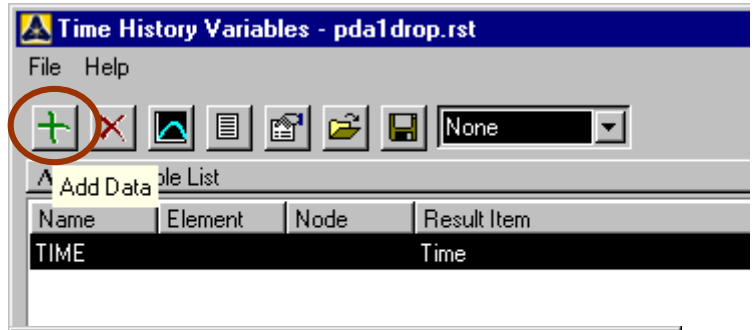
Defined Time-History Variables

Toggle Calculator On/Off

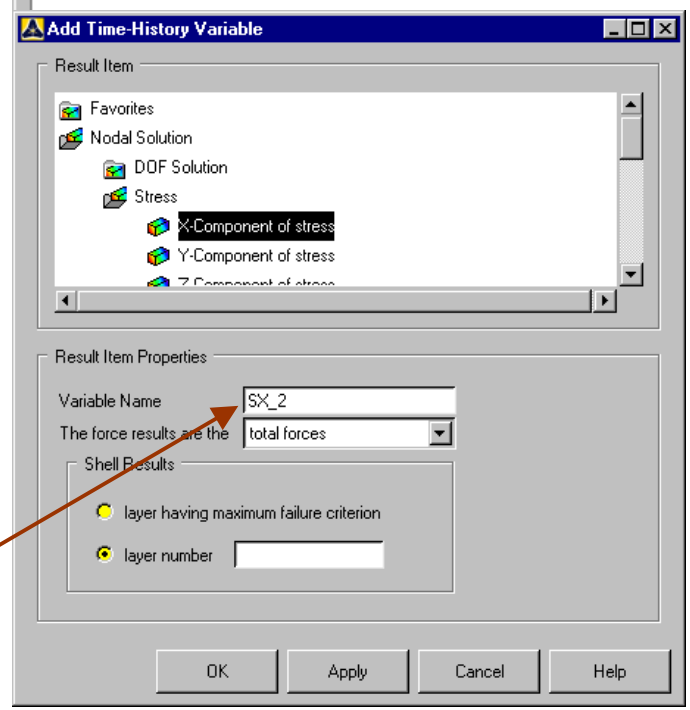


Defining Variables

- By clicking on the “Add Data” icon, as shown on the right, the user can define a variable.

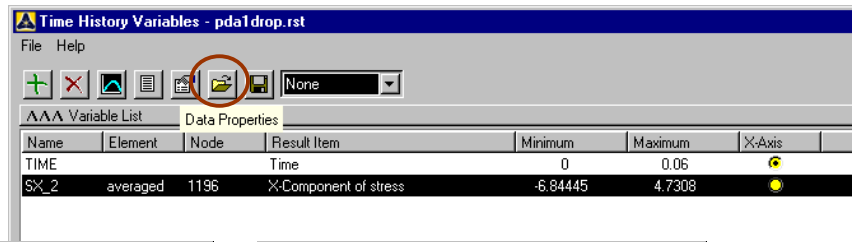


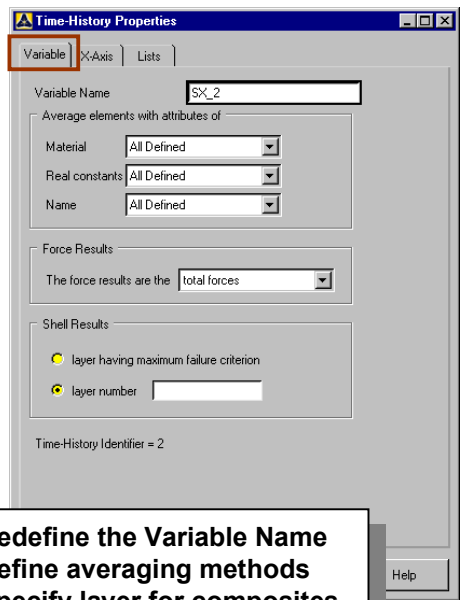
- After doing so, a separate dialog box appears, asking what results a user wants.
  - Everything is categorized under general headings, such as “Nodal Solution > Stress > X-Component of Stress”, as shown on the right.
  - Users can change the variable name or include other data, as needed.



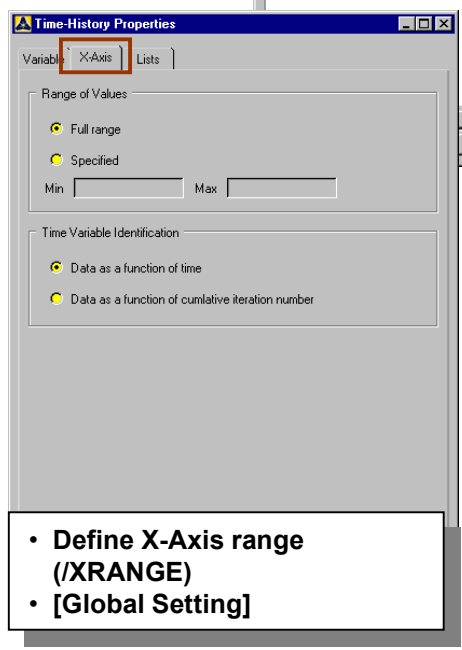
Setting Plotting/Listing Options

- **After selecting the elements/nodes of interest, the variable is now defined in the Time-History Variable Viewer.**
  - **Highlight your new variable and click on the "Data Properties" icon.**

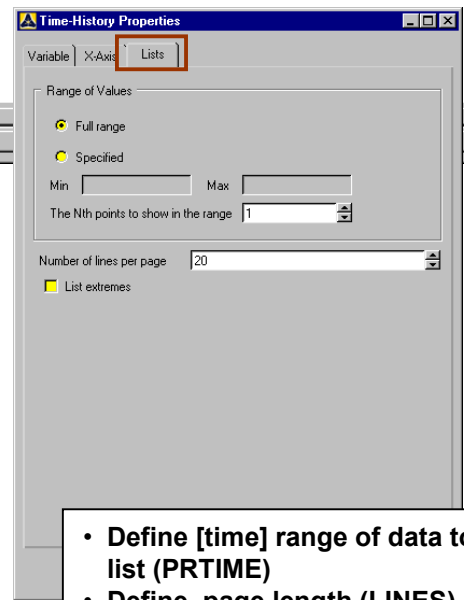




- **Redefine the Variable Name**
- **Define averaging methods**
- **Specify layer for composites**
- **[Variable Setting]**



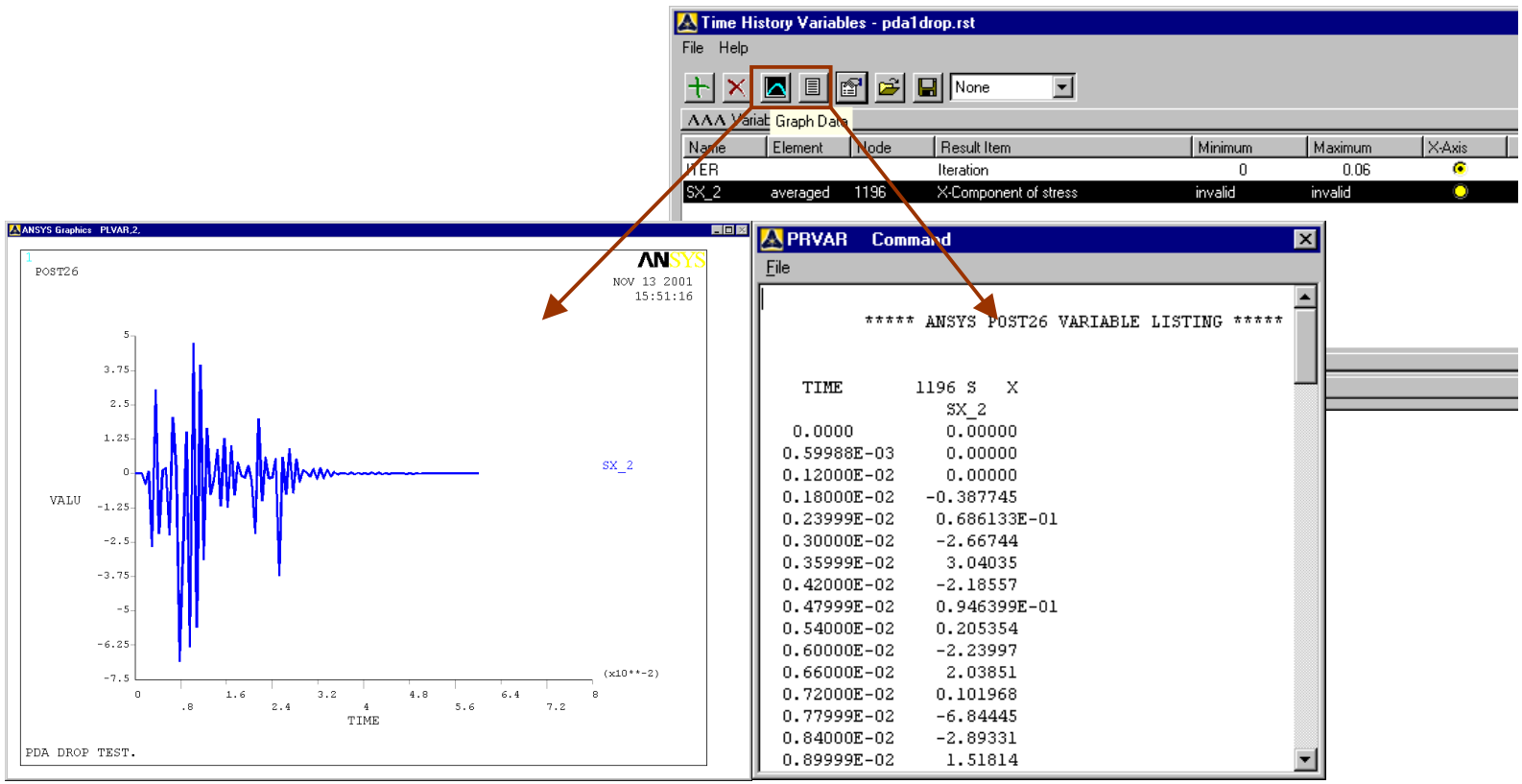
- **Define X-Axis range (/XRANGE)**
- **[Global Setting]**



- **Define [time] range of data to list (PRTIME)**
- **Define page length (LINES)**
- **[Global Settings]**

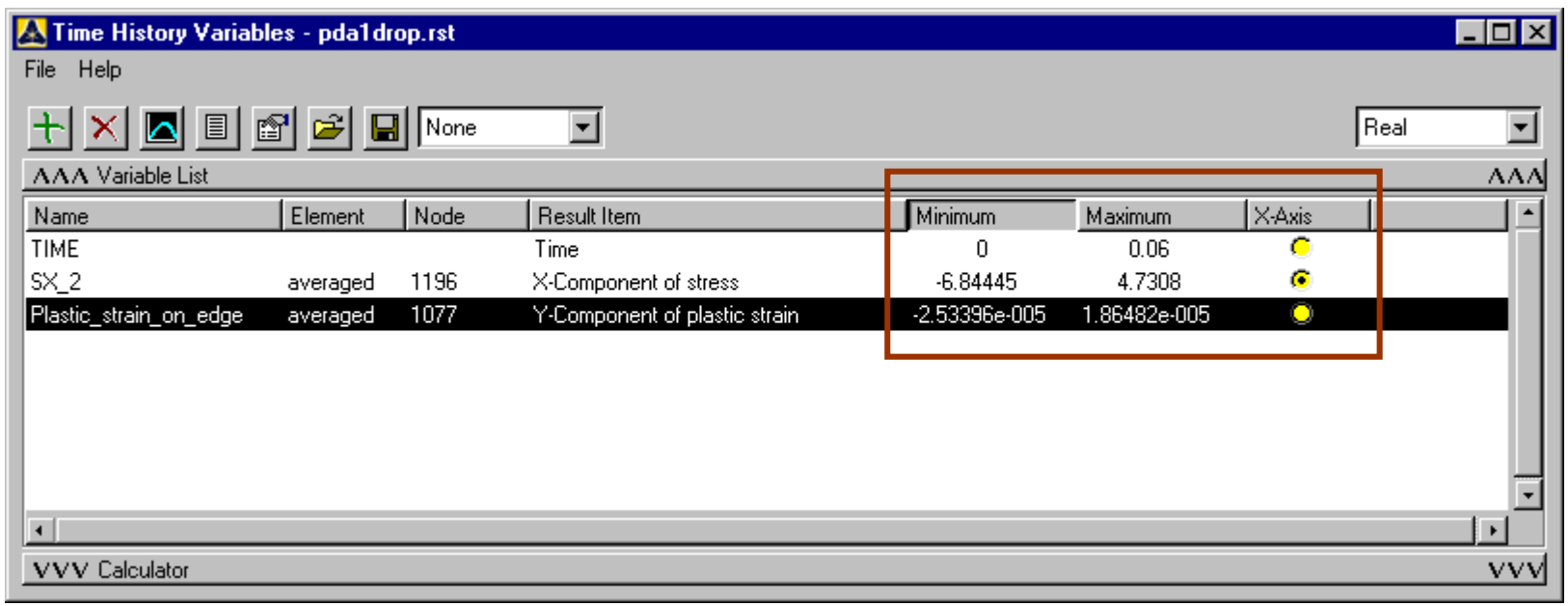
Graphing or Listing Variables

- **Once the user defines the variables (and any optional graph/list settings, as shown on the previous slide), the user can plot or list this data.**



Variables

- **Note also that other information is listed in the Time-History Variable Viewer window:**
  - **Minimum and maximum values are shown in the columns**
  - **It is easy to change the X-Axis from “Time” to any variable**
  - **Variables can be sorted on any column (name, min, node, etc.)**

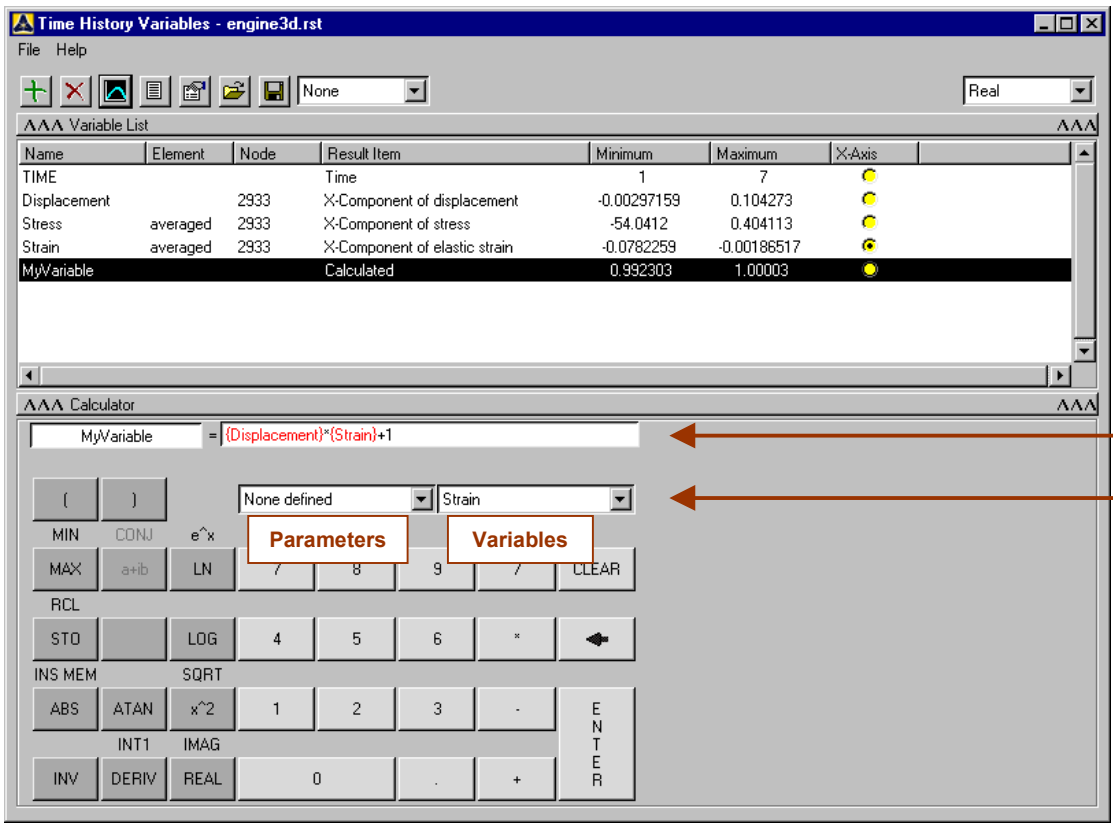


Other Variable Viewer Options

- **Other options are available within the Variable Viewer:**
  - **For complex values, user can select real, imaginary, phase, or amplitude from right-side pop-up menu.**
  - **Data can easily be exported to ASCII text files or arrays/tables.**
  - **Likewise, data can be imported from text files and used in *overlay* plots, useful to plot calculated vs. theoretical data.**
    - **Details can be found in the ANSYS 6.0 Online Help, *Basic Analysis Guide*, Ch. 6.5 "Importing DATA"**
  - **Multiple variables can be plotted at once, simply by holding down the Shift or Ctrl keys when selecting variables.**
- **Most /POST26 operations are supported in the Variable Viewer**
  - **RESP, RPSD, and CVAR are not currently supported, however. (Response Spectrum postprocessing)**

Calculator Interface

- **The Time-History Calculator lets the user easily manipulate the variable data.**



New variables are defined with a simple equation. Users can include both *APDL parameters* and existing *Time-History variables* to build the definition of the new calculated variable

New /POST26 Commands

Enhancements to Variable Names

- **Variable names defined with NSOL, ESOL, ANSOL, and math operations can be up to 32-characters long to provide more description to the user.**
  - **No spaces are allowed, so use underscores ("_") instead.**

- **Plotting and listing (PLVAR, PRVAR) can reference the variable *either by number or by the 32-character name***
  - **In the past, the user had to reference variables by number**
    - **PLVAR,2**
  - **Now, the user can reference the variable by its name as well**
    - **NSOL,2,430,u,x,My_Displacement**
    - **PLVAR,My_Displacement**

Addition of ANSOL Command

- **The new ANSOL command provides a way to obtain averaged element solution data**
  - **This is similar to PLNSOL (nodal data) in /POST1**
  - **User does not have to select element and node, as with ESOL. Instead, user defines node of interest only.**
  - **Averaging based on *material, real constant, or element type* can be defined. By default, ANSOL averages all adjacent elements.**
  - ***Please refer to the ANSYS 6.0 Commands Manual, "ANSOL" for details on use of this command.***
  - **Note: ANSOL is accessible either via commands or the Variable Viewer only. The *traditional interface* does not currently support ANSOL:**
    - **Main Menu > TimeHist Postpro > Define Variables**

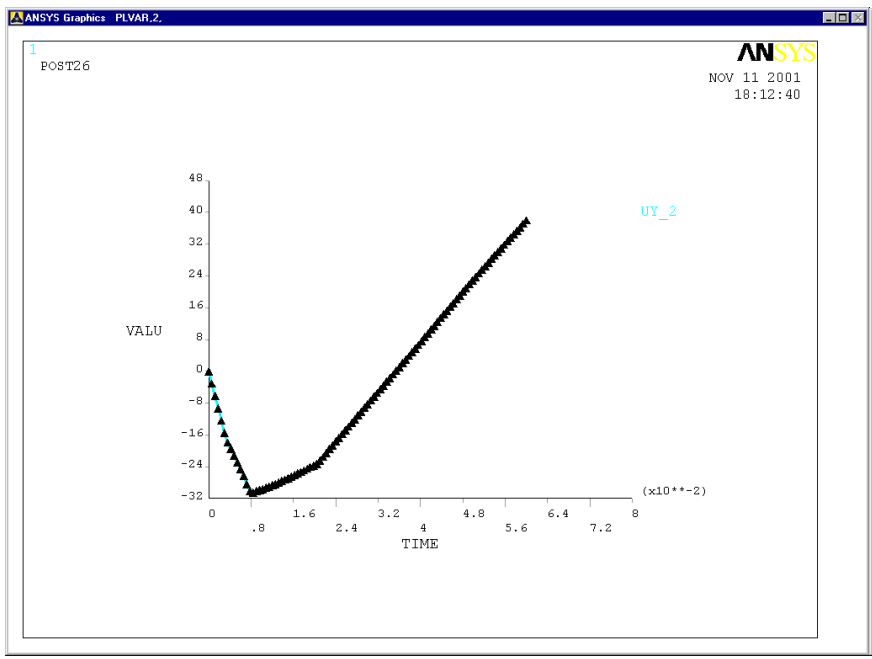
Keeping /POST26 Data in a Session

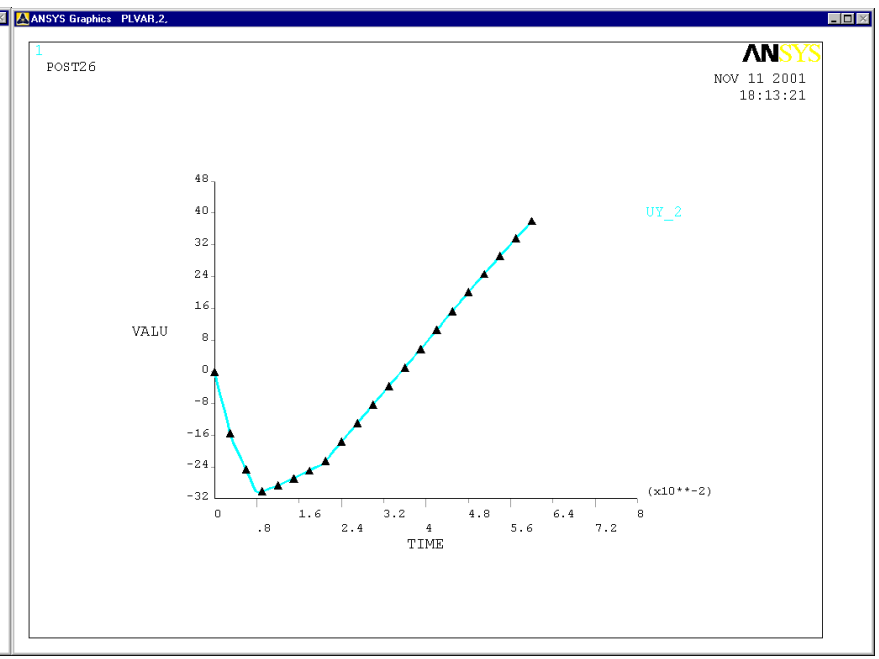
- **Users can now store Time-History variable definitions within the same ANSYS session. By default, the KEEP command is set to ON, so if the user leaves /POST26 to go to /POST1, time-history variables are still saved.**
  - **In the past, the time-history variables were deleted when user left /POST26. Now, they are kept by default.**
  - **Variable definitions are deleted when the user exits ANSYS. For longer-term use, the user is advised to copy the applicable commands from the jobname.log file to reuse in later sessions.**
  - ***Please refer to the ANSYS 6.0 Commands Manual, "KEEP" for details on use of this command.***

Enhanced XY Plotting Options

/GMARKER

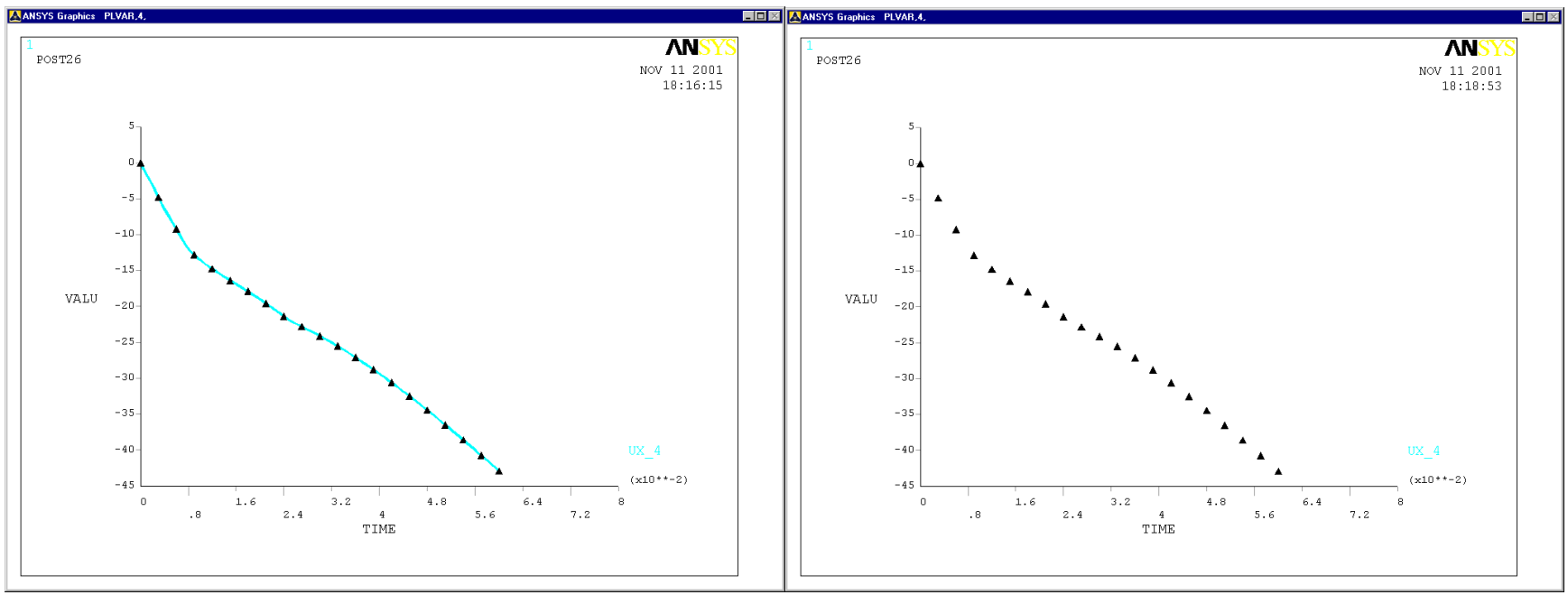
- **An additional third argument for /GMARKER allows the user to specify the frequency at which markers will be plotted on the curves.**
  - **Command: /GMARKER**
  - **Menu: Utility Menu > PlotCtrls > Style > Graphs > Modify Curve**





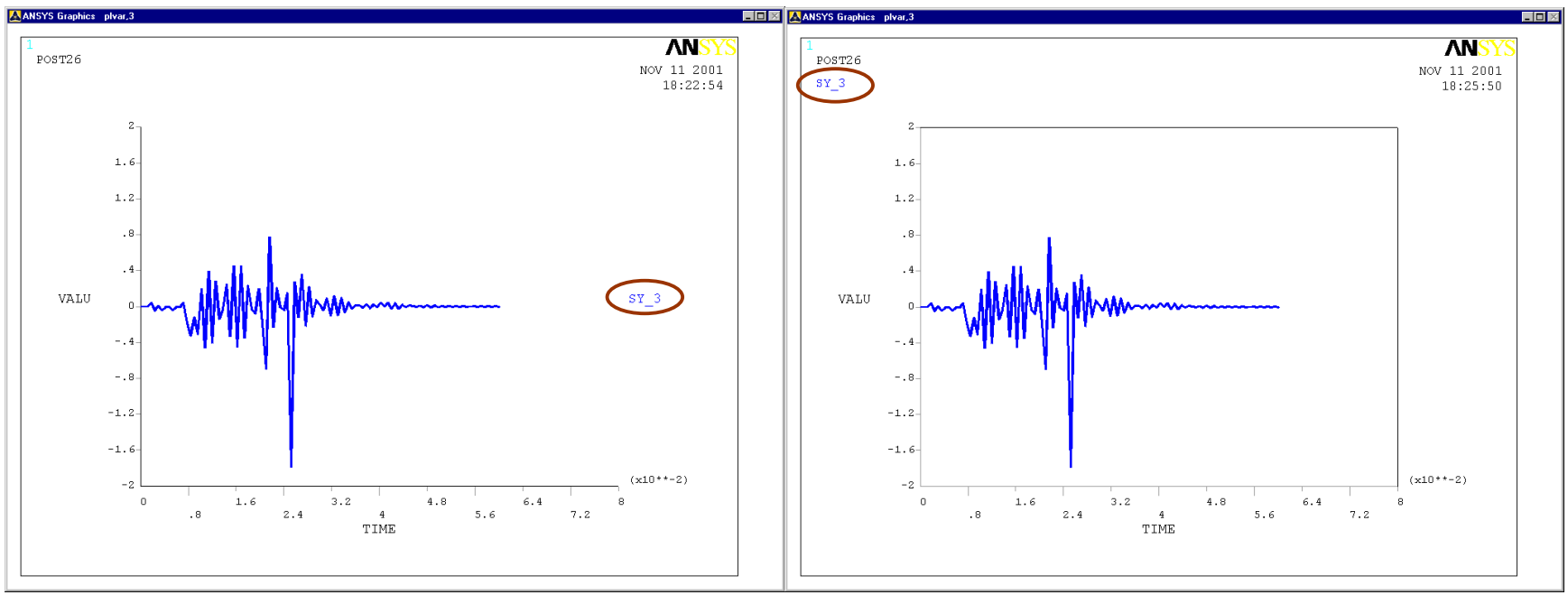
/GTHK

- **The second argument of /GTHK has been modified to allow hiding the curve line altogether, useful in the cases where the user wants to display markers only.**
  - **Command: /GTHK**
  - **Menu: Utility Menu > PlotCtrls > Style > Graphs > Modify Curve**



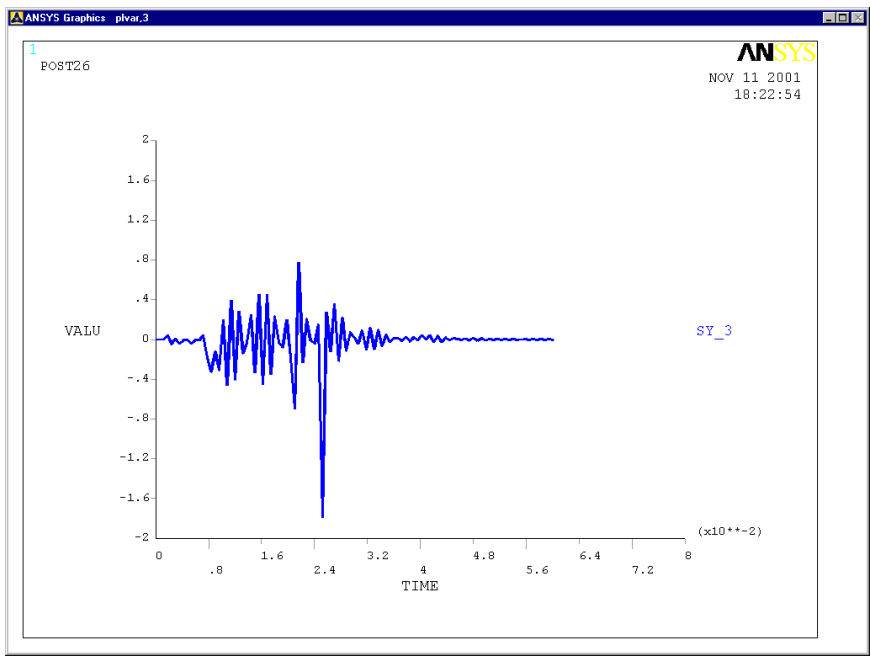
/GROPT

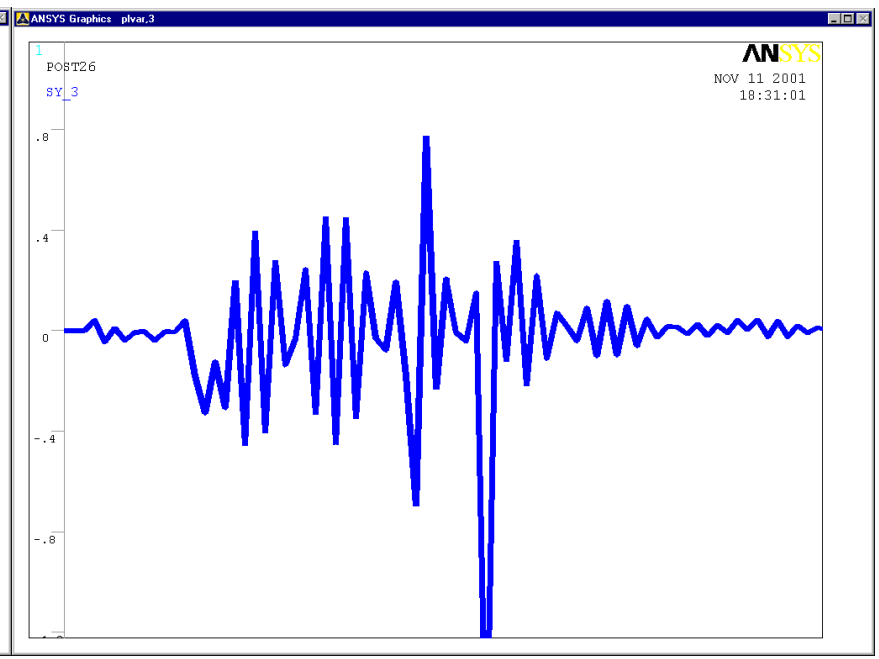
- **A couple of additional arguments have been added to /GROPT to allow the curve label to be specified in the legend and to plot axes in a given location.**
  - **Command: /GROPT**
  - **Menu: Utility Menu > PlotCtrls > Style > Graphs > Modify Axes/Curve**



/GROPT - Viewing Controls

- **Although not new at 6.0, it may be worth mentioning that /GROPT,VIEW allows the user to use regular Pan-Zoom-Rotate commands to zoom in and manipulate the view.**
  - **Command: /GROPT**
  - **Menu: Utility Menu > PlotCtrls > Style > Graphs > Viewing Controls**





Summary

- **In ANSYS 6.0, significant usability improvements have been added to provide easier time-history postprocessing.**
  - **The Variable Viewer enable users to define, edit, and manipulate time-history data in a simple GUI**
  - **New commands provide additional functionality, such as obtaining averaged element solution (e.g., stress, strain) easily**
  - **Graphing improvements give the user more control on how the plots look.**