

ADINA System Newsletter

Volume 3, Issue 4

www.adina.com

June 2001

We are glad to announce our plan to release Version 7.5 of the ADINA System in August 2001.

We demonstrated this new version already in a special advanced training seminar which was held at ADINA R & D on June 18-19, 2001. The emphasis of the training was on the state-of-the-art analysis of fluid flows with structural interactions. We plan to conduct more of such advanced training in the future depending on the demand for it. The special training seminar can also focus on metal forming or some other applications. Please contact us if you are interested.

Supported Platforms for ADINA 7.5

There are some updates regarding the minimum operating systems (OS) required for ADINA 7.5.

Platform	Minimum OS level
Compaq	Tru64 UNIX 4.0G
HP	HP-UX 10.20 ¹
IBM	AIX 4.3.3
SGI	IRIX 6.5
Sun	Solaris 7
PC	Linux kernel 2.4 ²
PC	Windows 98/Me, NT 4.0, 2000

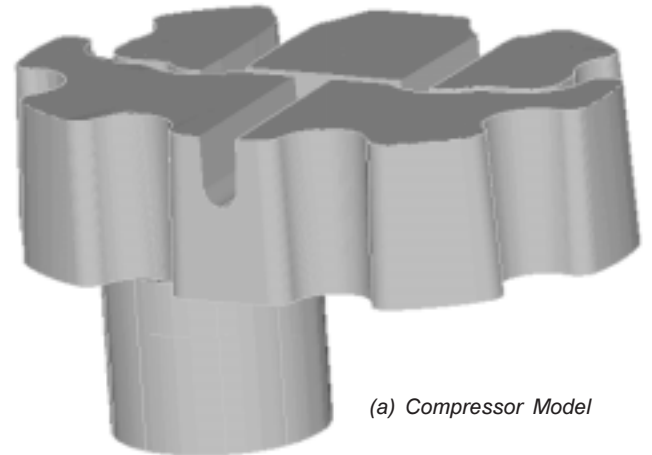
¹ PA-RISC 1.x chip will no longer be supported.

² ADINA-M will be supported on Linux.

In ADINA 7.5, we will also support the parallel version on the IBM and PC Windows platforms. The parallel version will therefore be available on all the platforms except for Linux.

We will support the full 64-bit version of ADINA 7.5 on HP HP-UX 11 and SGI IRIX 6.5.

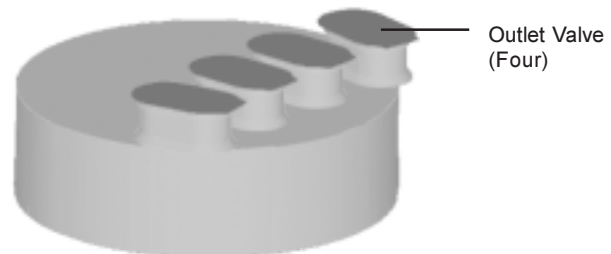
In addition, we will provide a 64-bit version of the solver programs which output 32-bit binary port-hole (result) files on the Compaq Tru64 UNIX 4.0G, IBM AIX 4.3.3, and Sun Solaris 8 platforms.



(a) Compressor Model



Inlet Valve



Outlet Valve (Four)

(b) Inlet and Outlet Valves

Figure 1: 3-D Compressor Analysis

Training Classes

The next ADINA-AUI training course will be held at ADINA R & D on September 13-14, 2001.

INSIDE THIS ISSUE

- 1 CAD Interfaces
- 2 Graphics Speed Improvement
- 3 User-Supplied Options
- 4 3-D Compressor Analysis

The full 64-bit version is used for solving very large problems. We provide here a very general guideline on which version to use.

- **32-bit version:**
Problems with up to about 500,000 equations.
This version can be used with TRANSOR.
- **64-bit solver with 32-bit porthole**
Problems with up to about 3 million equations.
This version can be used with TRANSOR.
- **Full 64-bit version:**
Problems with more than 3 million equations.
This version **cannot** be used with TRANSOR.

Note that the 64-bit database and binary porthole files cannot be read by the 32-bit version of the ADINA User Interface (AUI) and vice versa.

CAD Interfaces

The following is an update of the CAD interfaces for ADINA 7.5.

- The ADINA Modeler (ADINA-M) supports the import of Parasolid files with version 12.1 or below. Geometry from Parasolid-based CAD systems such as Unigraphics, SolidWorks, and SolidEdge can be directly imported.
- TRANSOR for I-DEAS supports I-DEAS MS7 and 8. The PC interface for I-DEAS 8 will be a native Windows version and will not require Exceed. As I-DEAS 9 is expected to be released this Fall, we will provide the interface some time after that.
- TRANSOR for Patran supports MSC.Patran 9.0 and 2000(r2).
- MSC.Nastran input files can be read directly into the AUI database. Only fix format files are supported.
- The Pro/ENGINEER interface supports Pro/ENGINEER 2000i and 2000i². We are also working on the interface to Pro/ENGINEER 2001 which was shipped recently.

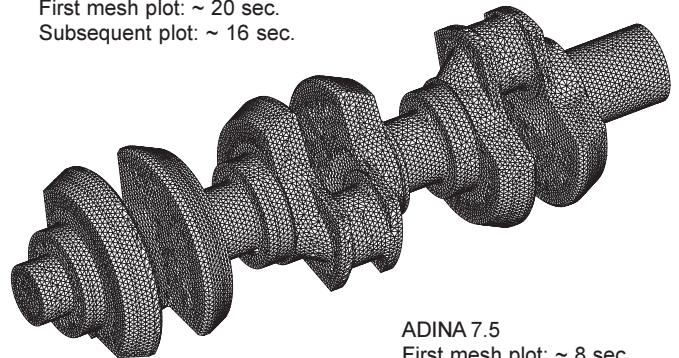
- The AutoCAD interface is provided for Mechanical Desktop 4.
- The IGES interface supports other CAD systems without a direct interface. The IGES geometry can be imported as wireframe or solid parts.

Graphics Speed Improvement

In ADINA 7.5, the display speed for mesh plots has been significantly improved. The improvement is independent of the graphics system used and is therefore applicable to all supported platforms.

As an example, we compare the time required to display the first and subsequent mesh plots of a crank shaft model with 229,779 elements. The test was performed on a PC with a 500 MHz Pentium processor.

ADINA 7.4
First mesh plot: ~ 20 sec.
Subsequent plot: ~ 16 sec.



ADINA 7.5
First mesh plot: ~ 8 sec.
Subsequent plot: ~ 2 sec.

Figure 2: Graphics Speed Test - Crank Shaft Model

Special Educational License

Many Universities have taken up our offer to use a special educational license that allows unlimited use of the ADINA System throughout the University. This educational license is also much easier to install and administer.

Note that there is NO additional fee to convert your current educational license to this special unlimited usage license. For Universities currently without an ADINA license, you can get it for a very low price.

In addition, the following features make ADINA very attractive for teaching and research in Universities.

- The 900 nodes version CD is included. This CD can be passed freely to students to install it on their own PCs. The models created with the 900 nodes version can be used with the full version in the University.
- User-supplied options (see following section) can be programmed.

Please contact us to convert your license to the unlimited educational license or for pricing.

User-Supplied Options

The user-supplied options in the ADINA solution modules allow users to program their own models. The following customizations are possible.

- **ADINA:**
User-supplied material models can be used with 2-D and 3-D solid elements.

User-supplied loads can be defined as functions of nodal coordinates, displacements, velocities, accelerations, masses, temperatures, etc.

User-supplied elements allow users to program their own nonlinear general element. The element can be a 2-D, 3-D, beam or shell element.

User-supplied fracture mechanics allows the implementation of new conservation criteria and new crack propagation models.

- **ADINA-F:**
User-supplied material models can be programmed for compressible flows, incompressible flows and mass transfer.
- **ADINA-T:**
User-supplied material models can be used with 2-D, 3-D, and shell conduction elements, and surface convection elements.

The user-supplied options are described in the Theory and Modeling Guide Volumes I to III.

Application Showcase

ADINA has been used successfully to solve a complex 3-D compressor problem using the fluid flow with structural interactions capability in ADINA. The geometry model is shown in Figure 1(a). The initial geometry is imported through IGES and volumes are constructed to build the model in the AUI.

The inlet valve and four outlet valves of the compressor are shown in Figure 1(b).

ADINA-F Theory and Modeling Guide

If your maintenance support for ADINA-F is current, you should have received the printed copy of the new ADINA-F Theory and Modeling Guide. Please contact us if you have not.

The online copy of the manual (in PDF format) can be downloaded from our web site. Please contact us for the password to our download page.

ADINA FTP Site

As part of our support for the ADINA System, it is sometimes necessary for you to send files to or receive files from us. We recommend the following guidelines when sending files to us.

- To minimize the transfer time, please compress the files (e.g. using winzip or gzip).
- If the file size (compressed) is 4 MB or less, you can send it to us as an attachment to your email.
- If the file size (compressed) is larger than 4 MB, please use our FTP site to send us the file.

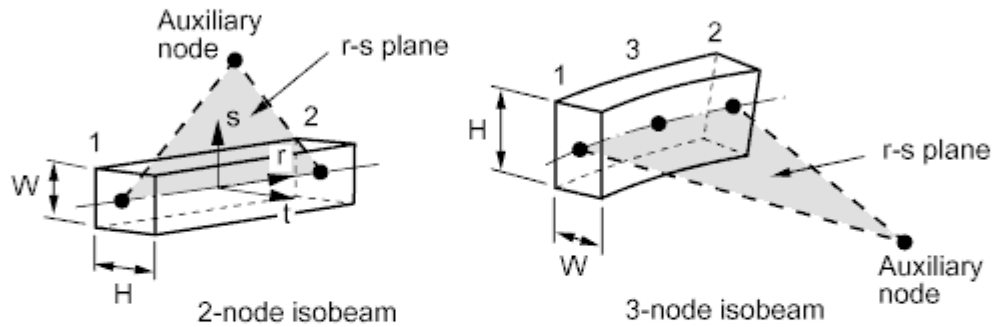
For help on how to access the ADINA FTP site, please see FAQ QG-004 on our web site.

Online Help

An illustration of the online help in ADINA 7.5 is shown in Figure 3 (next page). This illustration also serves to provide user hints on the orientation of beam cross sections.

Cross Section Orientation

It is **important** to note the local s - and t - axes when specifying the dimensions of the cross sections. The r -axis is along the axial direction of the beam. The r - s plane is formed by the two end nodes (node 1 and 2) of the beam and the auxiliary node. The width and height of an isobeam element are illustrated below.



Note that for plane strain, plane stress and axisymmetric isobeam, the auxiliary node is not used and the r - s plane always lies in the global Y - Z plane. Hence, for a plane strain or plane stress isobeam, the width W is used as illustrated below.

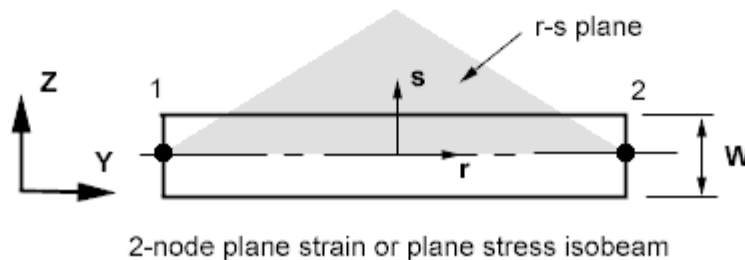


Figure 3: ADINA-AUI Online Help with Hints on Beam Cross Section Orientation

**A
D
I
N
A**

ADINA R & D , Inc.

71 Elton Avenue
Watertown, MA 02472
Telephone: (617)-926-5199
Fax: (617)-926-0238
Email: support@adina.com

ADINA is a registered trademark of K. J. Bathe
For additional information about ADINA please visit us at www.adina.com

FOCUSED ON EXCELLENCE