

# **ADORE Update Version 5.41**

**Release Date: March 20, 2009**

ADORE 5.41 is a minor enhancement to earlier version 5.40. The following specific enhancements have been incorporated:

## **Treatment of Unloaded Rolling Elements**

For certain ball bearings, it was reported that the quasi-static equilibrium module was encountering convergence problems. The problem was associated with the radial equilibrium solution under just the centrifugal force. The related numerical procedure was refined to take care of this problem.

## **Materials Data Base**

Some of the material properties in the property data base were revised to provide a better representation of the selected materials. As stated earlier, this data base is expected to continually refined and extended as the property data is collected for more materials.

## **Lubricant Churning and Drag Model**

When using English System of Units (lbf, in, s), the equivalent lubricant density on input data record 10.7 was actually required in slugs/in\*\*3, and not lbf/in\*\*3 as stated in the manual. This conversion is now internal in the program, so the input data can be in lbf/in\*\*3 as stated in the manual.

## **Start-Up Under Arbitrary Initial Conditions**

When starting ADORE with arbitrary initial conditions specified in file FINAL, (kIcOpt=-1 on Rec 1) computation of certain initial geometrical parameters was not identical to the procedures used with kIcOpt=0. This resulted in a small numerical difference in the iterative solutions. Thus the results were not identical to those obtained with either kIcOpt=0 or 1. Some minor modifications to program logic in subroutine AdrA2 were carried out under this revision to fix this problems. The solutions should now be identical under kIcOpt = 0, 1, or -1 with a prescribed set of input data.

## **ADORE Output When Encountering Truncation Error**

A full set of print output is now included in the PRINT.txt file each time a truncation error is encountered irrespective of the input print output options. This will help provide improved guidance in diagnosing the problem leading to truncation error.

## **ADORE User Manual**

There are no changes to the ADORE user manual. Therefore, the ADORE version 5.40 user manual is still current.

## **ADORE Input, Plot and Animation Facilities**

There are not changes to these facilities in this version. Thus adrInput, adrPlot and AGORE shipped with version 5.40 are still current.

## Test Cases

The normal ball and cylindrical roller bearing test cases are included with the program files; in addition to the input data print output files all plot data sets are included in the program media. These examples must be run and checked after installation of the program. All outputs, at least at step 0, must match against the supplied output.

While comparing the results with those produced by earlier versions some differences in the transient solutions and time step sizes may be observed. These difference are primarily due to code corrections outlined above.

## Program File Contents:

As usual program updates are distributed on a CD in normal data format. The files may be easily extracted from this disk on any computer system and then transferred to appropriate system for which ADORE is licensed for. The media may contains the following three subdirectories:

### Disk1

#### **Update541.pdf:**

A pdf file containing notes of the latest updates (this file).

#### **Update540.pdf:**

Updates associated with the last update, ADORE version 5.40.

#### **adoreInput.txt:**

A text file containing details of ADORE input data.

#### **adoreManual.pdf:**

ADORE user's manual containing detailed instructions for program installation and use.

#### **Ball:**

Subdirectory containing ball bearing test case

#### **Roller:**

Subdirectory containing roller bearing test case

#### **AdrxExamples**

Subdirectory containing few of the user program able examples via subroutine ADRX1.

### Disk2

#### **\*.f files:**

ADORE FORTRAN-90 source files

### Disk3

#### **setup.bat:**

Setup batch file to compile adrInput, adrPlot and AGORE on Windows system.

**adrInput.bat:**

Batch file to execute adrInput.

**adrPlot.bat:**

Batch file to execute adrPlot.

**agore.bat:**

Batch file to execute the graphics animation facility, AGORE.

**Java:**

Subdirectory containing all Java source.

## Program Installation

On the Windows system, if the Microsoft Developer Studio is used to create the executable, the following suggested procedure may be helpful.

1. Start Microsoft Developer Studio and select the File option to create a new project.
2. For type of application, select "Console Application" and name the application as adore51 or other desired name.
3. Once the project space is created, use the insert option to add source files. After navigating to the appropriate source directory, first add the file m\_parameters.f only. In the second step add all the m\_\*.f module files. In the final step add all the other source files. The file to be added is simply selected by a mouse click on the file in the selection window. To select more than one file, simply hold the Ctrl key while clicking the mouse.
4. Now use the Build option to create the executable.

**Java facilities adrInput, adrPlot and Agore**

Edit the setup.bat file in Disk3 subdirectory to correct the paths to all source files and the Java Development Kit. Execute the updated setup file to compile and install these facilities.

The setup files for the three applications may then be edited to update the paths and installed in appropriate directory compatible with the environmental variables which provide access to all executables.

## Contact Information

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