

ANSYS® Mechanical VRML Capture for 3D PDF Animation

Technical Note, v4, 16 October 2015

Version: ANSYS Mechanical APDL, Version 12.1, Windows, PDF3D® v 2.12.0

Introduction

ANSYS Mechanical is a popular Finite Element Analysis mechanical structure simulation software package used by professional engineers for structural integrity and design projects. By using the ANSYS “Classic” postprocessor, VRML files can be saved in a sequence using APDL scripting language. The resulting VRML files are merged with the PDF3D ReportGen into an interactive 3D PDF report.

Tutorial Method Description

APDL (ANSYS Parametric Design Language) may be used to generate interactive post processing reports in 3D PDF format, by following the steps in this tutorial.

Let us consider the ANSYS tutorial: "*Modal Analysis of a Model Airplane Wing*"
You can find its description at ANSYS help:

ANSYS Help System->Mechanical APDL (formerly ANSYS)->Tutorials->Modal
Tutorial->Modal Analysis of a Model Airplane Wing

Here are the steps to follow in this tutorial:

ANSYS can redirect plots to VRML file. To do this, you can use menu:
PlotCtrls->Redirect Plots->To VRML File or use APDL command "/SHOW,VRML"
Now, all scene plot will be written to wrl files inside current ANSYS workdir.

For example, you can write each frame of mode shape animation into wrl files.
To do this, select mode shape that you need: General Postproc->Read Results-> First Set/Next Set, next

select PlotCtrls->Animate->Mode Shape, fill animation parameters, for example

No. of frames 30

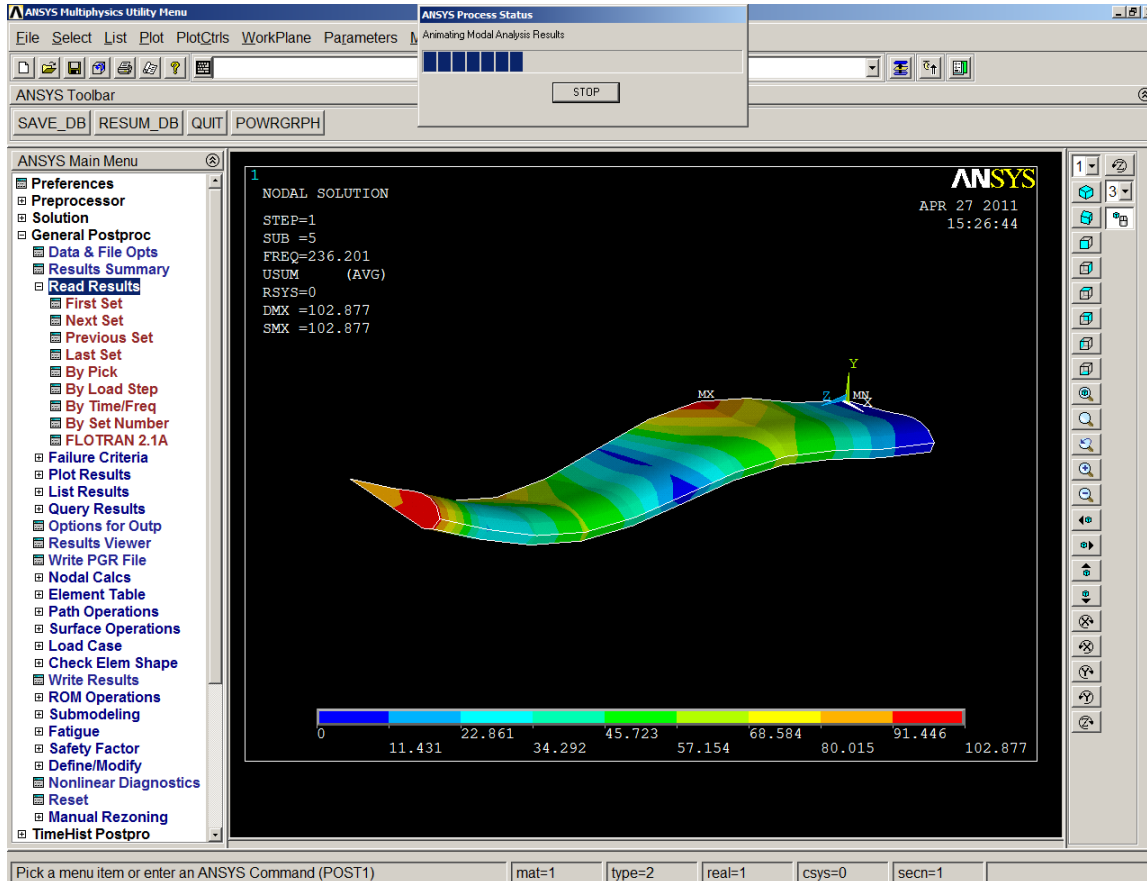
Time delay (seconds) 0.03

Display type DOF Solution, USUM

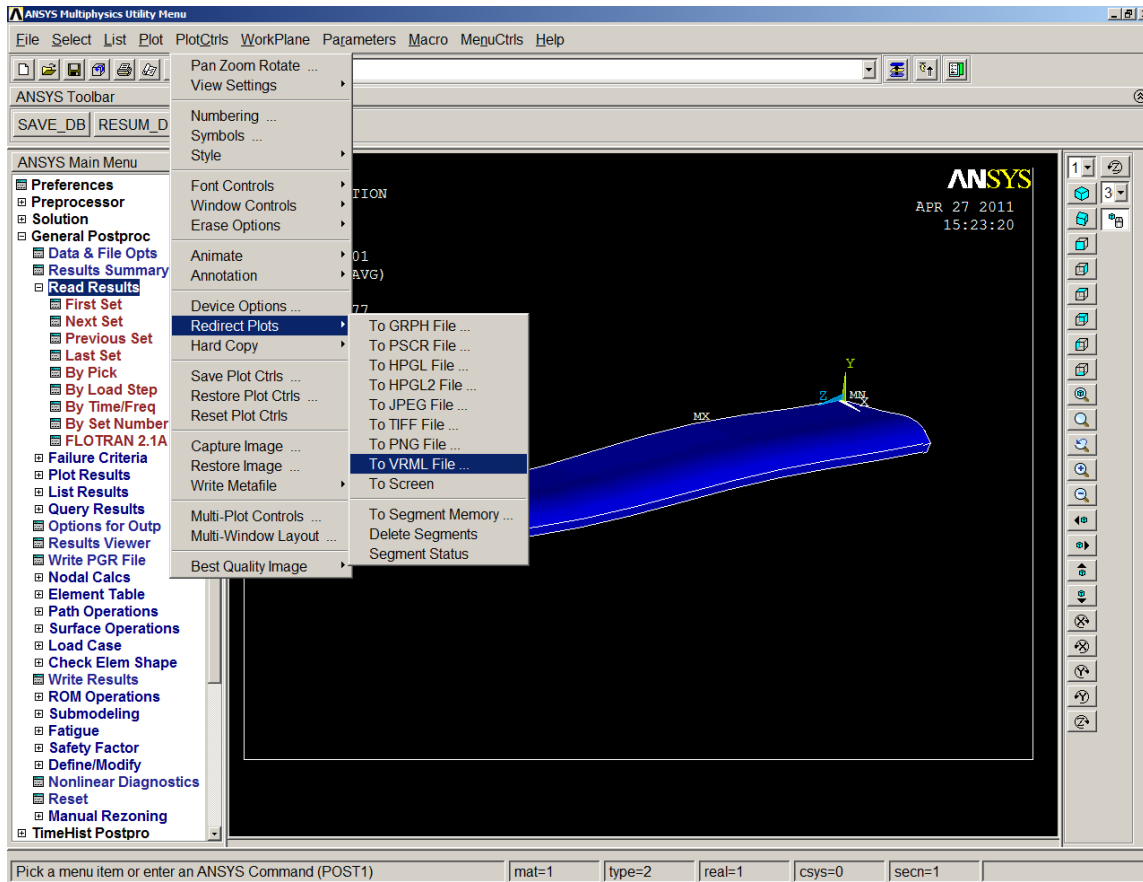
And press OK

Then ANSYS will create wrl files for each animation frame where wrl files in workdir will have appropriate numerical suffix numbers.

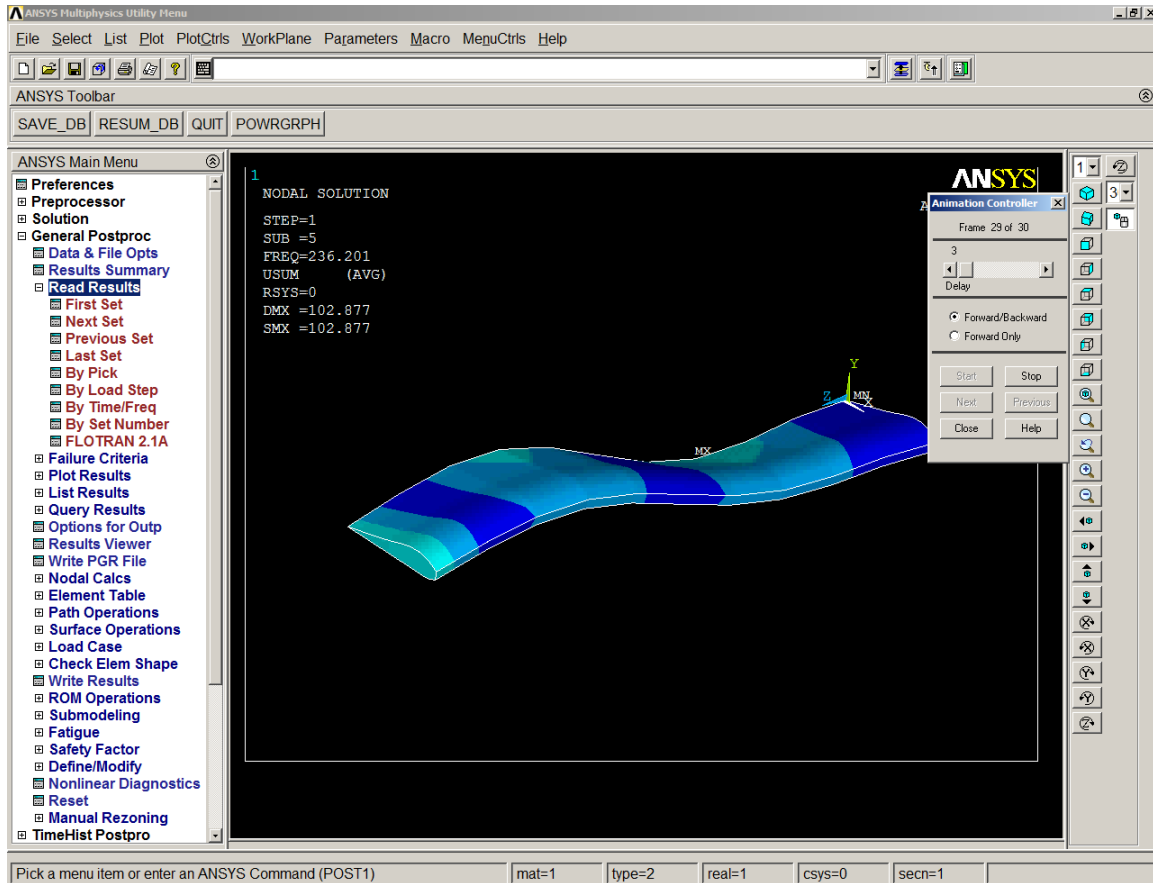
PDF3D systems can produce a pdf with the 3d-animation based on series of 3D data files (for example wrl-series). Most typically this uses the PDF3DReportGen desktop application. Once the set of wrl files is available in a folder, these can be loaded into PDF3DReportGen using multi-file select. The filtering optimizes color contours, removes unwanted scene markers, fixes some syntax issues, etc.



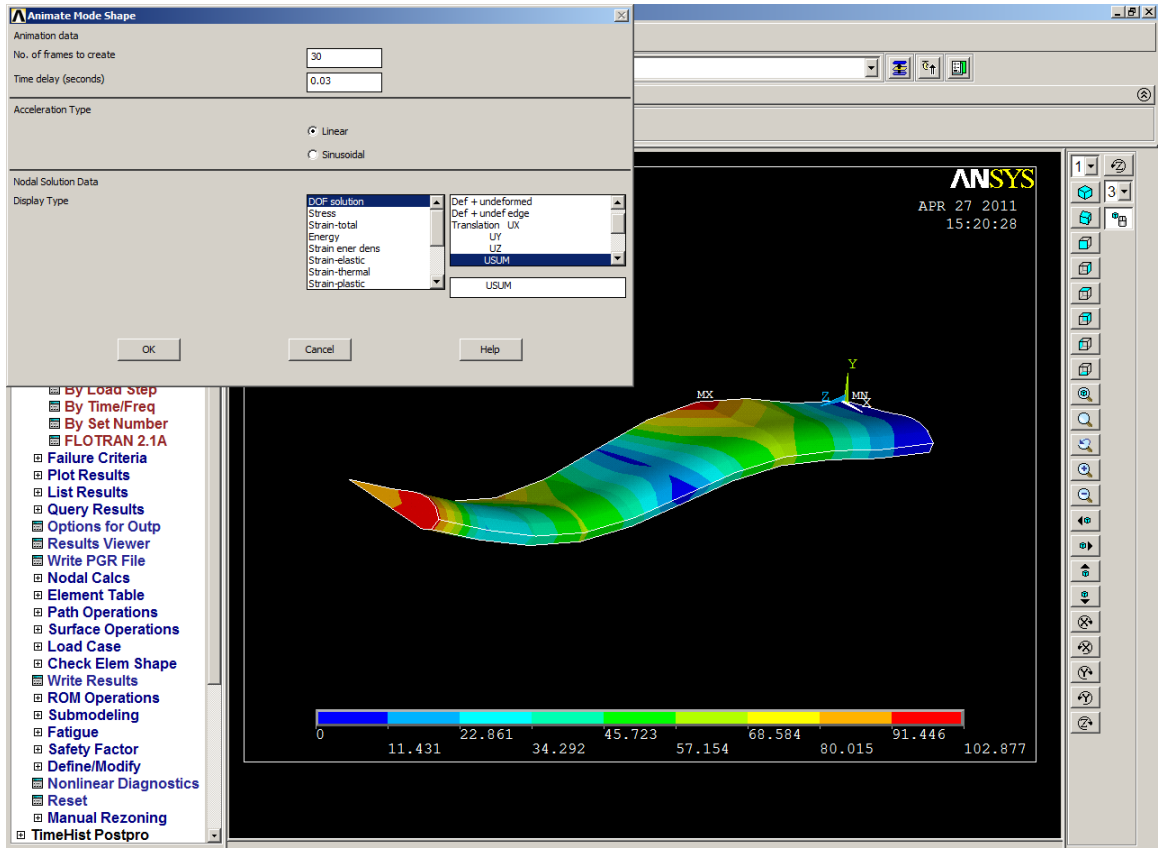
Step 1. ANSYS POST (Classical) review of modal simulation model.



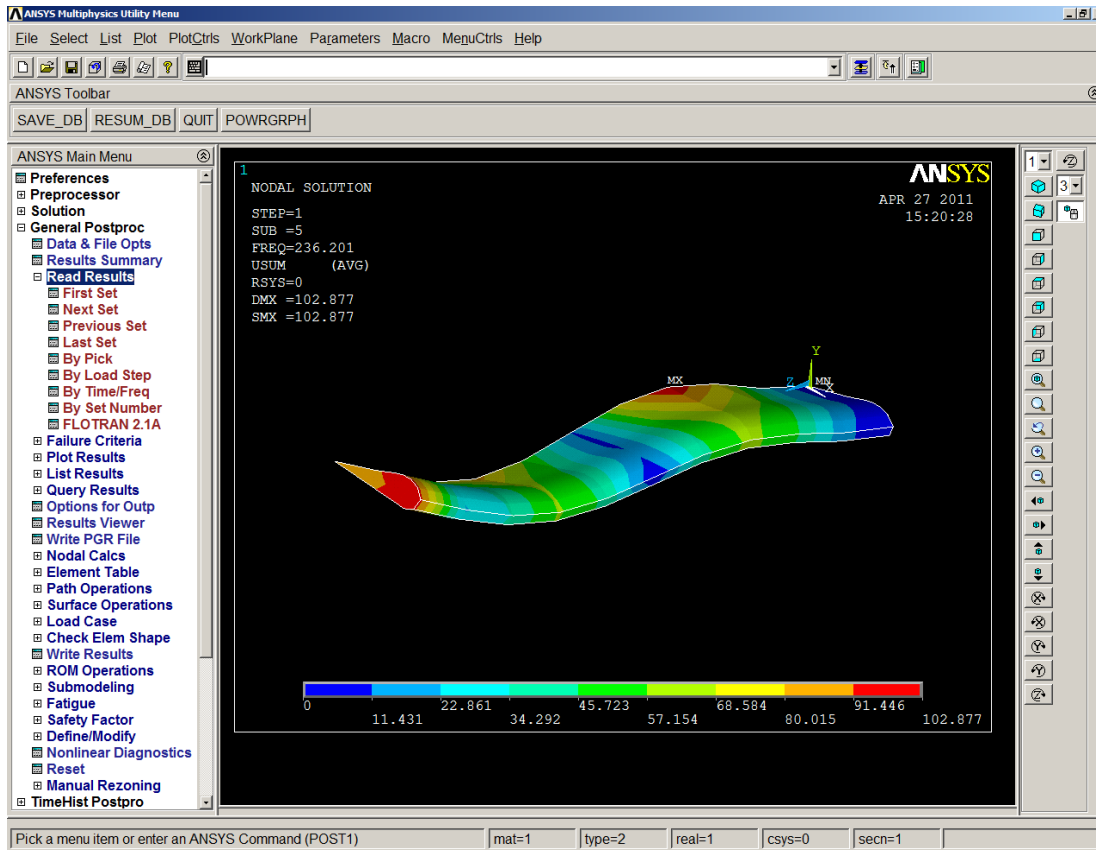
Step 2. Select Redirect Plots to VRML file...



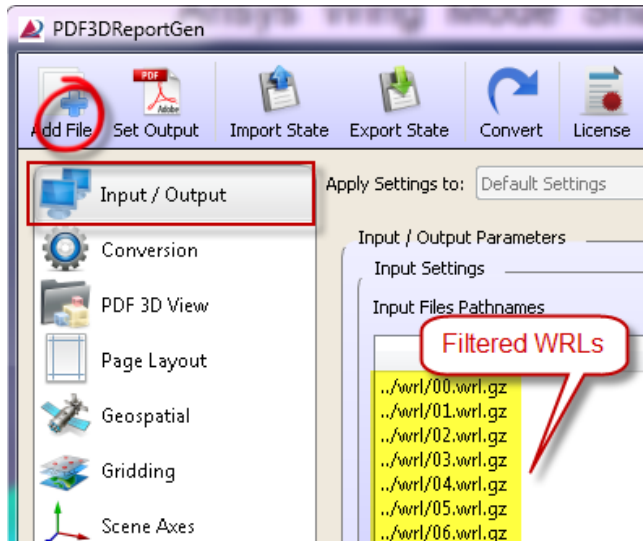
Step 3. Set Animation Controller to cycle through mode sequence



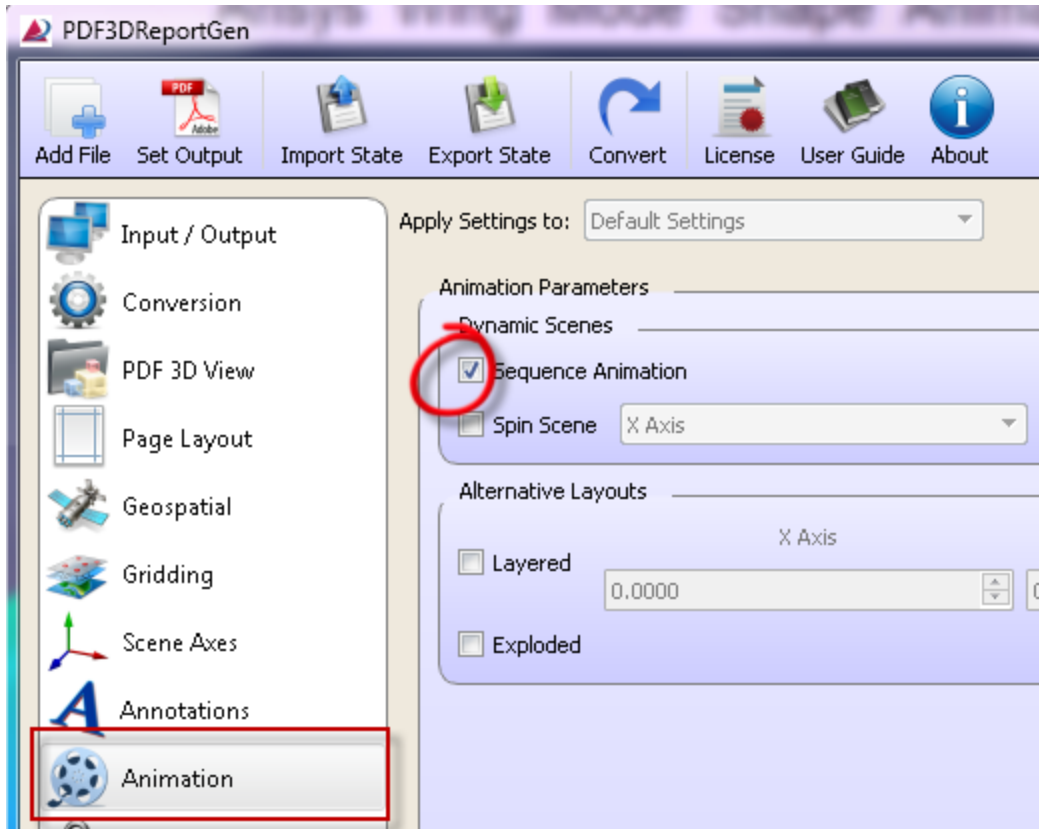
Step 4. Select animation mode shape parameters



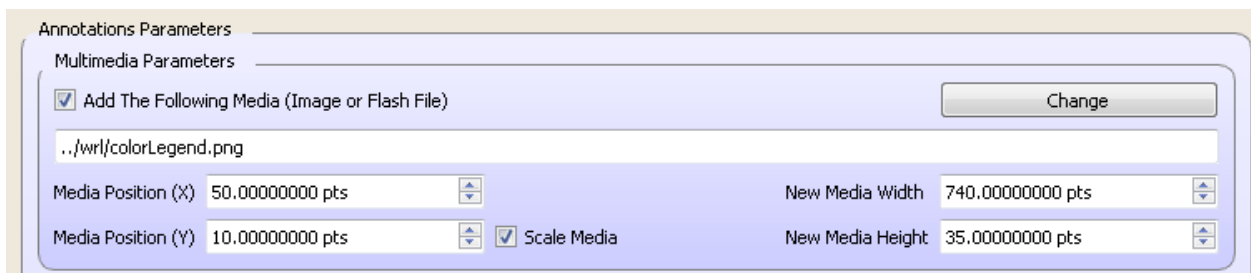
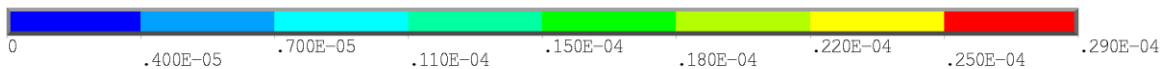
Step 5. Export sequence to external Folder (nnn.wrl)



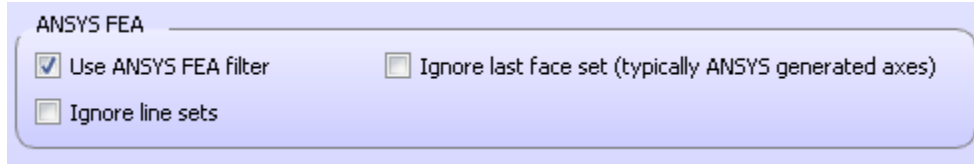
Step 6. Multi-select all sequence files into input menu of PDF3DReportGen.



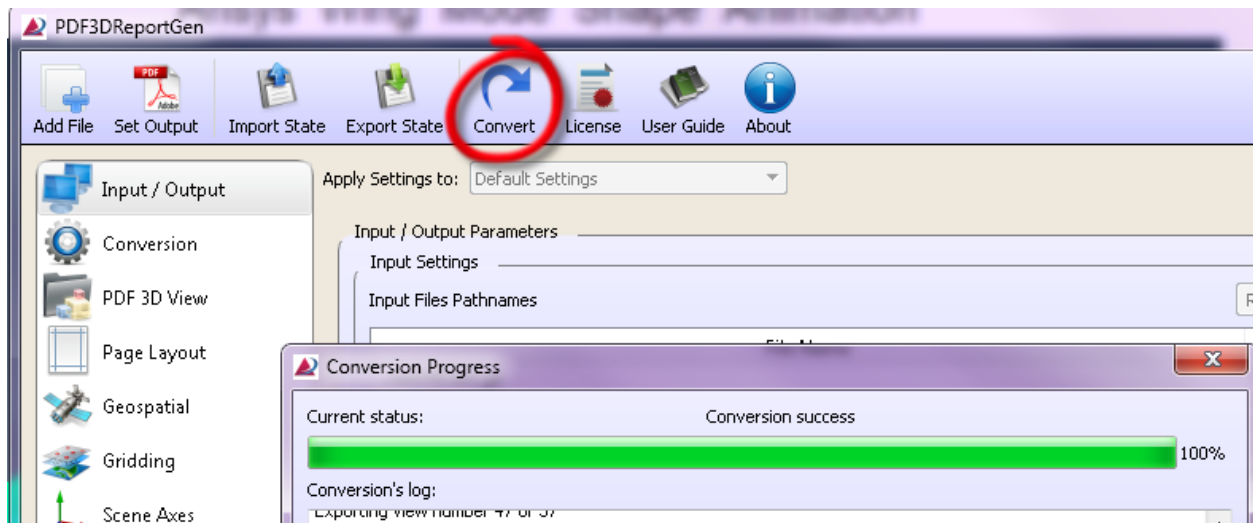
Step 7. Enable Sequence Animation



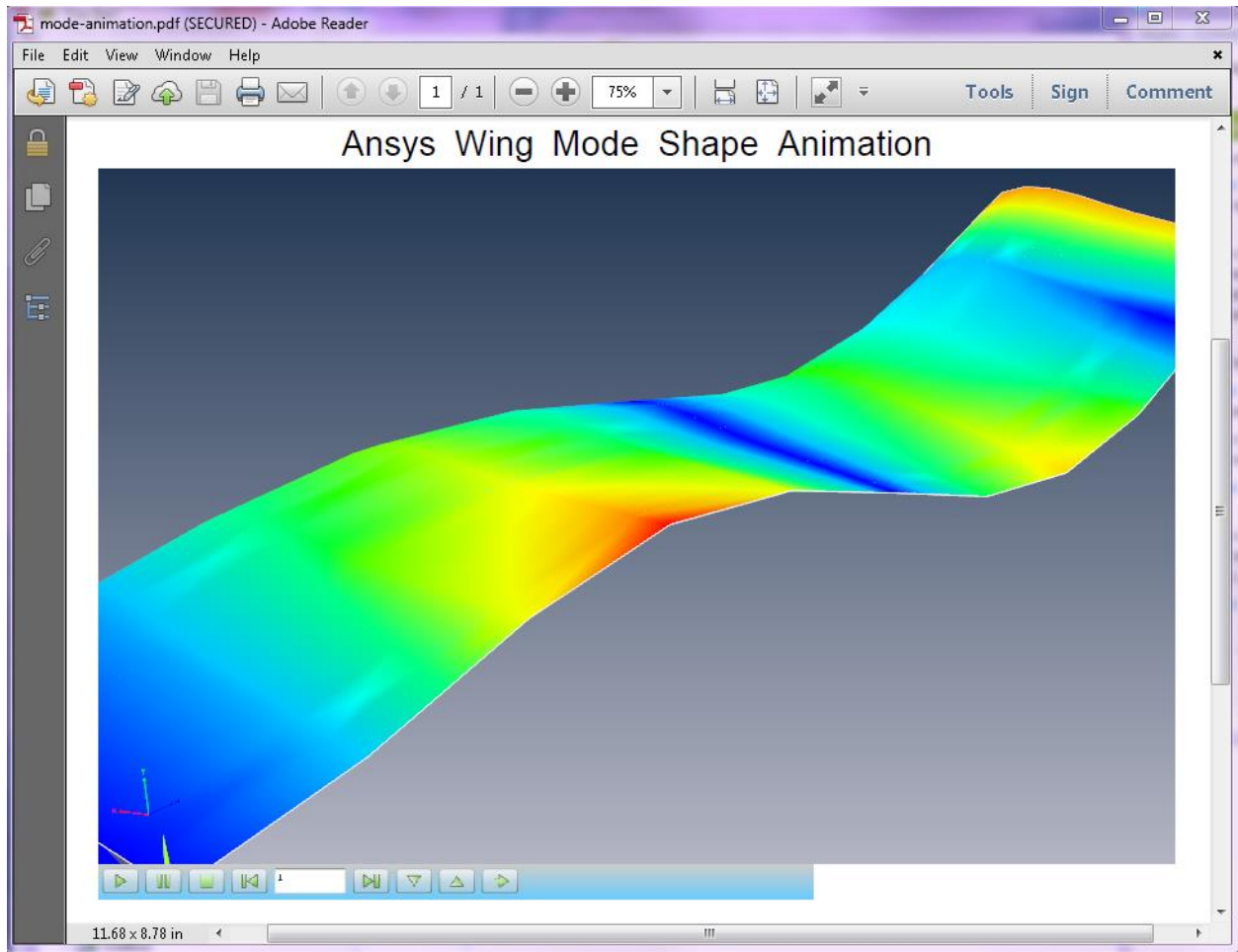
Step 8. (Optional) Add Legend Bar as PNG/JPEG Annotation Image on PDF page



Step 9. Set ANSYS processing mode. Go to Interface Settings, COIN Interface, and enable the special filter for typical ANSYS VRML files. If an addition axis or other object appears in the scene the last group can be ignored by enabling the “ignore last face” option.



Step 10. Conversion operation, generate 3D PDF file.



Step 11. View Result in Adobe® Reader