

OMNI3D RELEASE NOTES VERSION 5.4

OMNI3D is an interactive graphics postprocessor for 3D and 2D visualization of computational fluid dynamics results. OMNI3D version 5.4 is delivered with a set of executables, image libraries, context-sensitive help files, a sample Xdefaults file, and two sample plot files.

SYSTEM REQUIREMENTS

OMNI3D uses OpenGL graphics and a Motif graphical user interface. OMNI3D version 5.4 is available on Linux/Motif version 3/X11R6, Silicon Graphics IRIX 6.5, HP-UX 11.11, IBM AIX-4.3, and Sun Solaris operating systems. OMNI3D requires a high performance 3D graphics card with a minimum graphics resolution of 1024x768 pixels, 1280x1024 recommended. 512 megabytes of memory are recommended. OMNI3D requires OpenGL and Motif/X version 11.

NEW FEATURES IN OMNI3D 5.4

The following features are new for version 5.4. Most are described in more detail in the context-sensitive help files within OMNI3D.

Scroll wheel support has been added. If your mouse has a scroll wheel and it is supported by X, scrolling up will zoom in; down will zoom out. In Fast Transform mode (where intermediate transformations are rendered to the overlay planes or front buffer), hold down the SHIFT key when you start scrolling; release it when you stop.

The + key now zooms in to 200% of previous view scale. The – key zooms out to 50% of previous scale.

Multiple plot files can be specified on the command line. SHIFT-n toggles between plot models.

Sectional lift can be displayed for a 2D buttline cut, as well as area and chord length as before.

Surface curvature can be calculated and displayed as one of the body panel shading parameters.

The 2D cut plane may be specified by typing in the plane normal, under the “Skew” menu.

Light shading can now be turned on with parameter shading in filled panel mode, as well as for blended and contours. Additional light shading resources have been added: `Omni3d.lightMatAmbient`, `lightMatDiffuse`, `lightMatSpecular`, `lightMatShininess`, `light1Ambient`, `light1Diffuse`, `light1Specular`, `light2Ambient`, `light2Diffuse`, `light2Specular`. The `lightPosition` resource works as before. The default values of these resources are shown in the `Xdefaults.example` file in the help directory delivered with the software. The default light intensities are slightly darker so that the parameter color hue no longer

changes when lighting is enabled. Lighting resources beginning with light1 refer to monochrome (Geometry Only) mode; light2 resources refer to parameter color shading.

Off-body points may be rendered with depth-cueing.

The following commands have been added or modified in OMNI3D's command script language:

`DrawAxes`, `DrawColorScale`, `DrawFilename`, `DrawLogo`,
`DrawTitle`, `Echo`, `JPEGQuality`, `MPEGBegin`, `MPEGCompression`,
`MPEGDecodedRF`, `MPEGEnd`, `MPEGFilename`, `MPEGMaxFrames`,
`OffScreenImageSize`, `OffScreenImageText`, `OffScreenWriteJPEG`,
`OffScreenWritePNG`, `PrintSetReverseBW`, `ResetElapsedTime`,
`ShowElapsedTime`, `UseDisplayList`, `VectorVar`, `VectorGeomOnly`
See the `OMNI3D_SCRIPT_COMMANDS.pdf` file for a list of arguments. In addition, the rotation angles are now specified in degrees, rather than tenths of a degree.

CHANGES IN OMNI3D 5.4

Within OMNI3D, select Changes from the Help→ menu to see a list of the changes in reverse chronological order.

The compare plot files menu panel has changed so the user only has to specify plot1 and plot2 once. The 2D compare solution option has been replaced with the compare plot files menu. To compare two solutions in a single file, set plot1 and plot2 the same and then change the solution for one of the plots. The compare plots/solutions code is much more robust when models containing different numbers of patches, panels or other data are compared.

On most platforms, 3D rendering can be performed in display list mode or immediate mode. For Linux, the faster display list mode is now the default. The initial setting can be changed using the `Omni3d.renderDisplayList` resource in the `.Xdefaults` file.

The initial rotation point is set to include to symmetry plane for symmetric models (VSAERO RSYM=0.0).

Spanwise load interpolation has changed to reduce “jaggies” away from panel centers.

2D menu panels may be closed separately.

Off-body velocity scan location is included in OMNI3D's view point calculation when “View All Solutions” toggle is turned on. When off, only the current solution's body geometry is considered in setting the view.

Zooming with perspective on in 3D now changes the field of view, rather than the screen z location. If you cannot zoom any farther with perspective on, turn it off and continue zooming. To return to the old translation-style zooming, set the `Omni3d.middleMouseZoom2` resource to `false` in your `.Xdefaults` file.

Note that this resource only affects zooming by dragging the middle mouse up and down; scroll wheel and +/- key zooming always change field of view. Also, the minimum perspective angle (field of view) has changed from 3° to 1°.

Off-body plane and solution cycling slider has been changed to more closely represent frames/sec. The slider's range is approximately 0.3 fps to 200 fps.

Bounding box zoom and aspect information are now written to the view (.vue) file.

SHIFT-o only pops up the file selection widget the first time, appends to the open file thereafter. The "Save 2D Points" menu button pops up the file selection widget each time.

SHIFT-p toggles perspective on and off in 3D mode.

CONTROL-SHIFT-h produces a hardcopy, if all environment variables are set correctly (previously, SHIFT-p was the "hot" key for this action).

3D parameter shading in Contours mode uses the whole color scale now. Previously, two colors on the blue end were unused.

Unstructured patch initialization is much more efficient—previously, order n^2 processing time, now, order n , where n is the number of panels in the plot file.

BUGS FIXED IN OMNI3D 5.4

The bugfixes.hlp file in the OMNI3D help directory is a text file listing the minor revisions of OMNI3D in order, and which bugs were fixed. The following is a brief list of bugs fixed in OMNI3D version 5.4.

The following program crashes were fixed in 5.4:

- In "Compare Plots" mode, numerous program crashes resulted from toggling between models with different data. These bugs could occur on reading the file, popping up menu, toggling models or solutions, picking, turning on streamlines, wakes or off-body data, making patches invisible, toggling between filled and blended panel mode, and much, much more...
- Streamline or boundary layer display or picking with smooth corner lighting caused a segmentation fault for some plot files.
- Turning on 2D mode in an OMNI3D script file sometimes caused a segmentation fault.
- In 2D mode, "Save 2D Points" caused a segmentation fault in Blended Data mode or when Compare Diff was turned on.
- In 2D mode, adding a panel to a group could cause a segmentation fault.
- In models with rotational symmetry (RSYM<0), inquiring on one of the rotated blades caused a segmentation fault.
- If user attempted to select a panel range (CTRL-select) by clicking on two different patches, a segmentation fault sometimes occurred.

OMNI3D now releases the license when the user closes the OMNI3D main window or clicks "Cancel" from the file selection widget before any plot file has been read in.

CTRL+SHIFT key combinations sometimes failed. On the HP, CTRL+key hot keys did not work properly for w-z.

Inquire widget now pops up in the correct location, pops down when 'i' key is released, and highlights the panel before popping down (Linux).

The user no longer has to click on the window to return focus to the graphics window when menus pop up (Linux). (e. g. using v to toggle between 2D and 3D view).

In 2D plots, the chord was displayed incorrectly when blended data mode was off.

In 2D plots "Panel Groups" mode, selected panels were rendered incorrectly in 3D when the plot file had multiple frames (USAERO). Also, an incorrect solution number was printed in the inquire window.

Some bugs in display and manipulation of zapped wake panels (USAERO) and wake strength shading were fixed.

Geometries with moving frames (USAERO) were drawn incorrectly in 2D and in 3D when contours were displayed with smooth lighting.

Off-body data were not displayed correctly as points, or as filled contours plus outlines, or when mesh lines were drawn over the body geometry.

Under Linux 2.6, solution or off-body plane cycling would freeze periodically.

Unstructured panel upper/lower surface indicator was output incorrectly from "Save 2D Points" (SHIFT-o).

Area calculation was incorrect for rotated blades ($RSYM < 0$).

2D plot no longer moves when user drags the mouse with the 3D translation or rotation mouse buttons depressed.

OMNI3D now parses the `lightPosition` and `viewPerspective` resources correctly.

Panel group number was always set to 0 in the menu.

Skew angle was doubled if the text input widget was activated by the enter key.

OMNI3D did not draw the 2D cut correctly if the first cut selected in the command script (demo) file was a station cut.

Contour colors were incorrect when user specified the `colorScale` resource in the `.Xdefaults` file.

User-defined contour colors no longer reset on redraw.

Contour color values were not reversed when $\text{min} > \text{max}$.

Off Body widget no longer generates Motif warnings when it pops up.

Print Screen did not work correctly when reversing black and white.

3D projection was distorted if view was read from a file produced by an OMNI3D session with a different aspect ratio window.

Bounding box zoom now drawn correctly on systems with no overlay planes.

In 2D plots, grid spacings were incorrectly calculated, which in a larger than requested min/max range.

OMNI3D could not display SURF data unless the plot file also contained AERO data.

In 2D plots, Solution Totals were plotted incorrectly if there was only one solution in the plot file.

The file selection widget has been modified so its initial position can specified in the .Xdefaults file, it doesn't resize when the directory is changed, and it doesn't reset and leak memory every time it pops up.

Some menu panels had misaligned or overlapping buttons.

The text input widget now accepts input from anywhere in the window, instead of requiring the cursor to be over the text field itself (Linux).

Message and warning boxes no longer overwrite each other.