

## Changes to FRANC3D from Version 7.4.5 to 7.4.6

Feb 19, 2020

- 1) Add support for transferring ANSYS node table data.
- 2) Improve search for closest point to Bezier surfaces.
- 3) Check for load amplitude change on a node within a \*step for ABAQUS.
- 4) Fix bug in ABAQUS .inp reader where there is blank space in the \*material type.
- 5) Add option to run checks on input FE mesh data when importing.
- 6) Fix SIF plot drop-downs for load substep when the number of substeps changes for a crack step.
- 7) Fix bug in XY axis plot formatting.
- 8) Fix multiple crack insertion command line output if rotation is not defined.
- 9) Fix mesh on/off check box for read and merge crack growth dialogs.
- 10) Add option to display crack surface geometry to crack growth dialogs.
- 11) Revised the fatigue cycle progress dialog to allow the user to cancel.
- 12) Fixed the fatigue dialog total cycles/time label.

## Changes to FRANC3D from Version 7.4.4 to 7.4.5

Jan 8, 2020

- 1) Surface mapping of remeshed surfaces improved by passing surface normals when merging local+global model portions.
- 2) Add check for ANSYS uncracked doubled meshes.
- 3) Fix command language for ABAQUS extra contact (small sliding) and for default template radius for multiple flaw insertion.
- 4) Show all surface labels for extra connections for ABAQUS and ANSYS local+global connection.
- 5) Revise fatigue spectrum plot dialog to display reasonable x-axis values when zooming out.
- 6) Several bug fixes for cycle integration; specifically for the case when Kmax is at or near Kc at one or a few points along the crack front.
- 7) Revised stopping criteria and related messages for cycle counting, and eliminated an 'abort' for the case of a user-specified single cycle.
- 8) Ortho/perspective view option added to Preferences.

## Changes to FRANC3D from Version 7.4.3 to 7.4.4

Dec 5, 2019

- 1) Surface normals carried forward for ABAQUS coupled/constrained surface nodes to aid in correct transfer/mapping after remeshing.
- 2) ANSYS post-processing macro edited for crack face contact.
- 3) Contact pressure for multiple load steps (or substeps) correctly applied.
- 4) Extra option to anchor a crack at a node so that only translation occurs.
- 5) Crack geometry refinement level correctly retrieved from GUI.

## Changes to FRANC3D from Version 7.4.2 to 7.4.3

Nov 15, 2019

- 1) Adjust tolerance for Jacobian determinant when mapping boundary conditions for the case where FE units are e-6 or less.
- 2) Fix an issue displaying retained nodes for an edge or line of nodes.
- 3) Add support for ANSYS transient analyses
- 4) ANSYS constraint (CEINTF) MoveTol and Tol options added to dialog for local+global connections.
- 5) Fix InsertFileFlaw command to process modifications to flaw & template parameters from what is stored in the .crk file.
- 6) Fix bug in temperature conversion in fatigue life computations.
- 7) Fix bug when switching FE model units in fatigue life dialog.
- 8) Fix "stack overflow" in fatigue life dialog when counting cycles from multiple events.
- 9) Switch some "int" types to "long long" in fatigue life to prevent overflow.
- 10) Fix sleep time for MSWindows when waiting for RLM license after an analysis has finished.
- 11) Turned off crack front curvature correction for mode II with crack face traction (CFT) or pressure.
- 12) Fix bug in VCCT SIF computation with CFT or pressure.
- 13) Added button for plotting resolved SIFs to Advanced menu (this is not described in the documentation yet).
- 14) Fix equation display in the view response dialog.
- 15) Modified the Read Crack Growth dialog to support reading new front data for multiple crack fronts with the ability to not advance a front.
- 16) Add check box for crack front fitting to disable automatic updates to the extrapolation.
- 17) Add check box to apply crack front fit to all fronts for the case of multiple fronts.
- 18) Add button to local+global connection to turn on/off global set & surface labels.

## Changes to FRANC3D from Version 7.4.1 to 7.4.2

Sept 23, 2019

- 1) Revise XY plots and equation format
- 2) Add check for local and global midside node ID mismatch when splitting FE data
- 3) Update to ABAQUS .rpt reader for element nodal stress
- 4) Update to ANSYS reader and postprocess script for modal analyses
- 5) Bug fix for ANSYS solid187 elements with missing node IDs
- 6) Revise path for SIF and fatigue plots when crack fronts split and/or disappear
- 7) Bug fix for case when closure flag is set in fatigue growth model
- 8) Bug fix in kink angle when Kmax and Kmin are swapped
- 9) Add plot tab for delta K threshold
- 10) Fix displayed model and result file name after Playback

- 11) Fix load step/schedule when adding crack face traction directly to auto-growth
- 12) Remove folder (path name) from external crack face traction files if same as work directory

#### Changes to FRANC3D from Version 7.4 to 7.4.1

Jul 30, 2019

- 1) Add preliminary timing output – you can request timing from the Preferences dialog
- 2) Fix a couple issues with ANSYS I/O; in particular, update load step for a change in omega when that is the only change in boundary conditions
- 3) Fix bug when computing SIFs for orthotropic materials using DC and VCCT methods
- 4) Fix GUI freezing after closing the Crack Front Plots dialog
- 5) Fix recording of lists of empty lists in session log
- 6) Check relative geometry patch size for multiple flaw insertion and set the refinement level if needed to make patch sizes consistent
- 7) Add analysis output type (full model, local model, template only) to session log

#### Changes to FRANC3D from Version 7.3.4 to 7.4

Jul 15, 2019

- 1) Add preliminary capabilities for computing elasto-plastic J-integral from ABAQUS results
- 2) Modified ABAQUS writeDtpFile.py script to extract data for elasto-plastic J-integral
- 3) Modified crack face traction (CFT) to allow user to add CFT to an existing load step and added options for setting temperature and thermal expansion properties for CFT in a new load step
- 4) Modified SIF XY Plot dialog to allow jpg or png export
- 5) Modified SIF XY Plot dialog to allow user to set axis scale and label
- 6) Modified SIF XY Plot to add extra legend for SIF computation options and terms
- 7) Color crack front edges for user-defined (bounding points and mesh) crack display
- 8) Process ANSYS shell (and 2D) elements along with 3D volume elements – shell elements sent to the GLOBAL model .cdb file
- 9) Fix some command language bugs and missing options for ANSYS – including the Python script and local+global connection settings
- 10) Allow for more than 99 ANSYS extra (.s##) load step files
- 11) Ignore unreferenced (not part of elements) nodes during crack insertion and remeshing
- 12) Fix GUI-related bug with temperature independent table-look-up crack growth models
- 13) Fix bug when writing crack growth model description text to file
- 14) Fix GUI-related bugs when displaying SIFs for multiple load steps and substeps
- 15) Add option to save .crk file during crack front merging
- 16) Fix crack insertion/meshing error messages
- 17) Fix bug finding mesh boundary facets when brick and tetrahedral elements are joined (without pyramids)
- 18) Process commas in quoted strings for ABAQUS inp data
- 19) Add preliminary capability for ANSYS static + modal combined analyses

- 20) Small change to point-in-region testing to improve crack front extrapolation.
- 21) Updated FOX library to the latest stable release
- 22) Updated RLM library to Version 13.
- 23) Updated internal license version – old license files will need to be updated.