Altair

HyperWorks

Altair HVVH Tutorials 2019

HVVH-6000: Solution Tab

altairhyperworks.com

In this tutorial, you will learn how to:

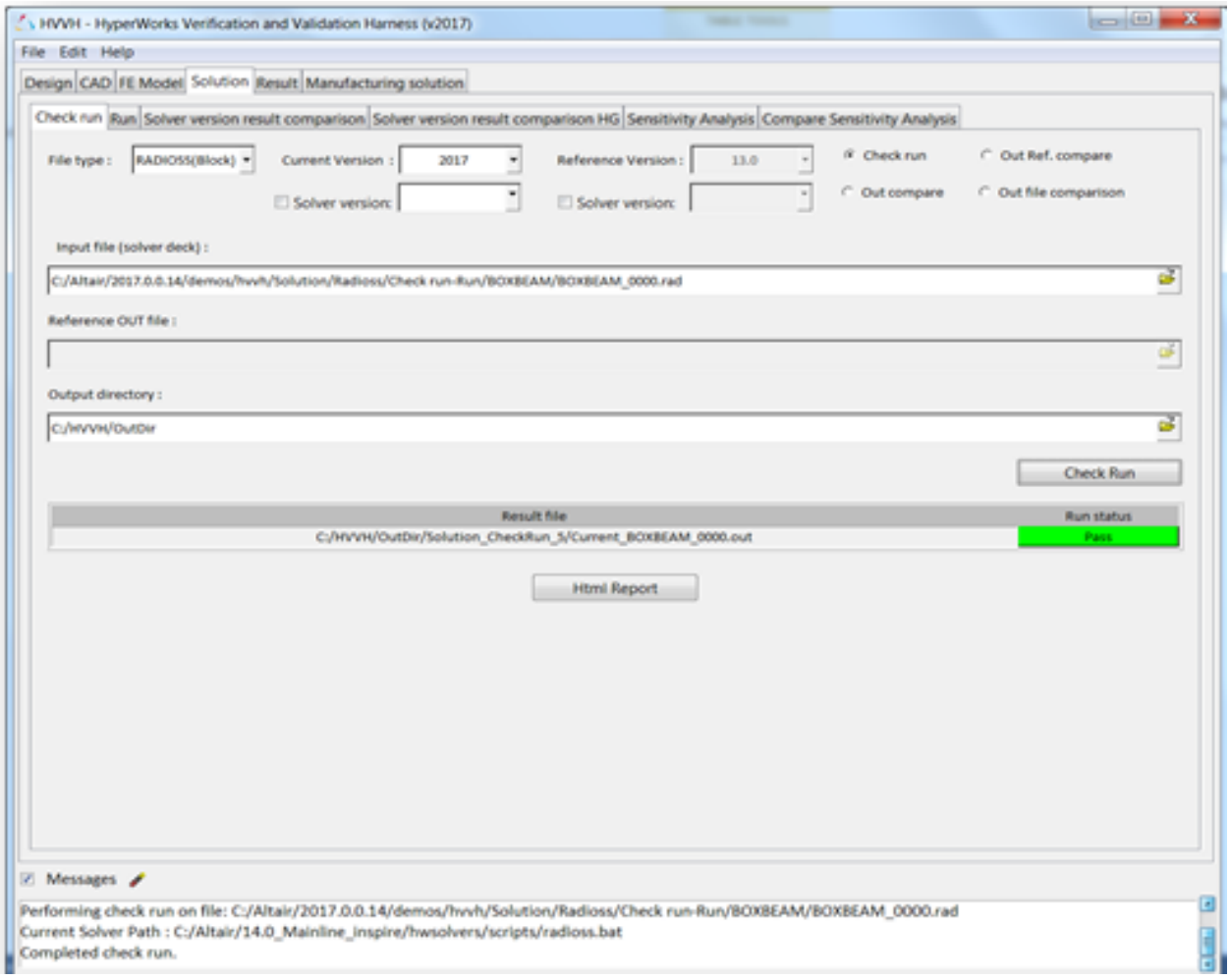
- Check run a solver deck (Altair Radioss or Altair OptiStruct).
- After a check run, compare OUT files of Altair OptiStruct-written result files.

Three options are available for the solver Check Run.

1. Two OUT files generated from the solver run (Altair Radioss or Altair OptiStruct) can be compared.
2. The current solver run OUT file can be compared with the reference OUT file.
3. Two OUT files generated from the same solver deck using two different solver versions can be compared.

Step 1: Check run solver data for an Altair Radioss deck.

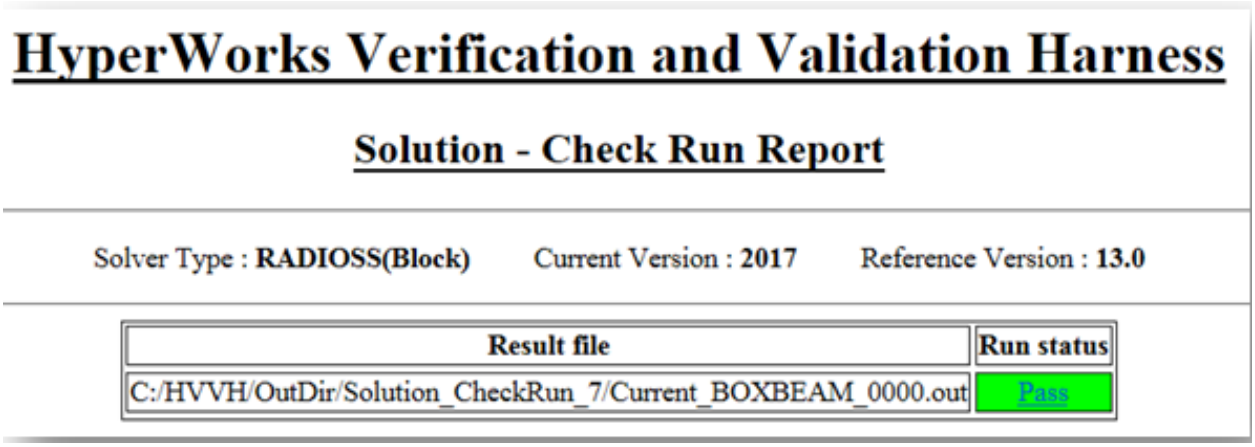
1. From the ***Solution*** tab, select the ***Check run*** tab.
2. Activate the ***Check run*** option.



3. For **File type**, select ***RADIOSS(Block)***.
4. For ***Current version***, select **2017**.

5. Under **Input file**, use the file browser icon, , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Checkrun\BOXBEAM\BOXBEAM_0000.rad`
6. For the ***Output directory*** field, use the open file icon, , to select an output directory.
7. Click ***Check Run***.

   After the check run is complete, the status of the run is displayed in the **Messages** window.
8. In the **Messages** window, the run details are displayed along with the log file location.
9. Errors are indicated with the label **Fail**, otherwise, they are labeled **Pass**.
10. Click ***HTML Report*** to view the HTML report.


HyperWorks Verification and Validation Harness

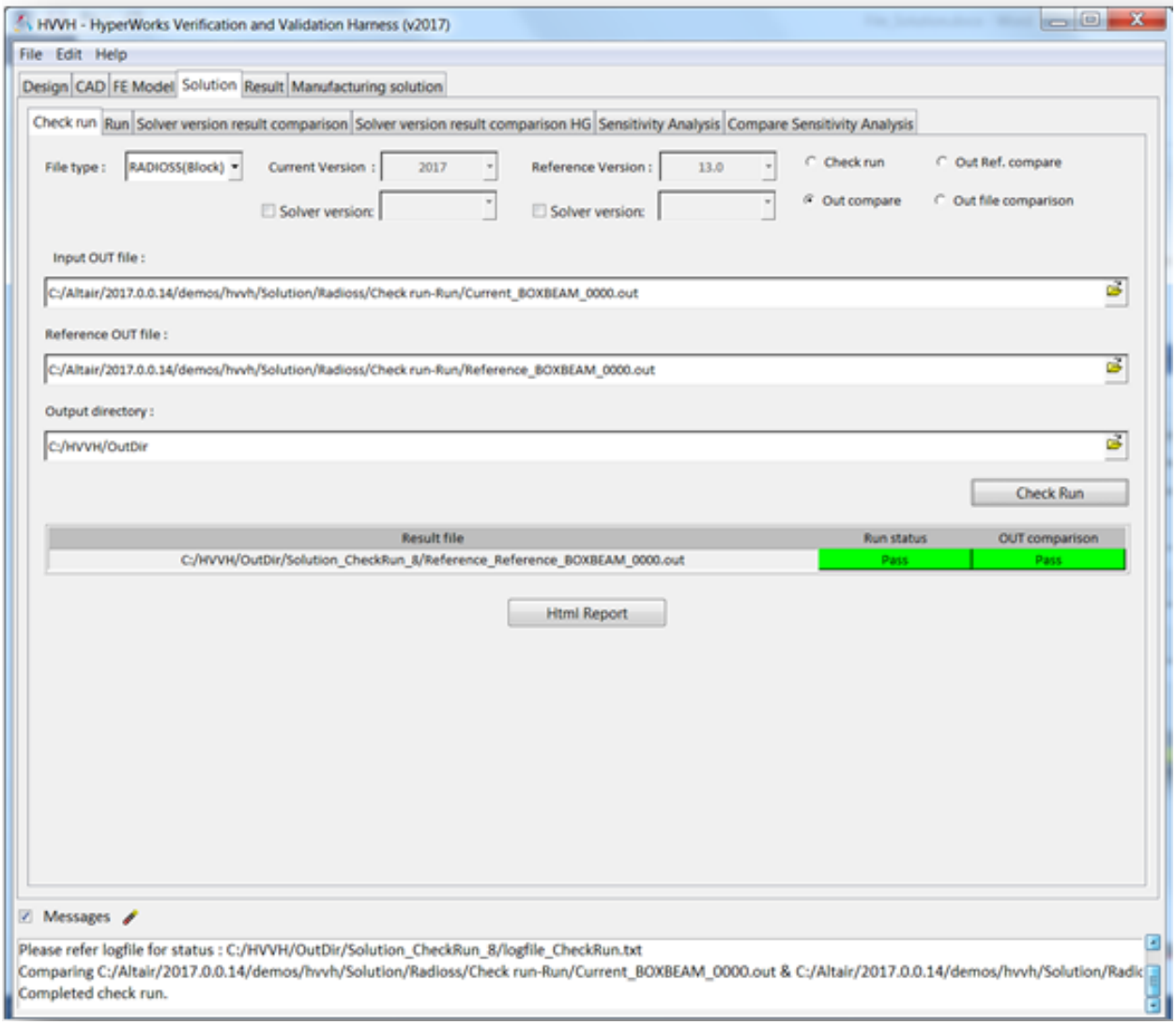
Solution - Check Run Report

Solver Type : **RADIOSS(Block)** Current Version : **2017** Reference Version : **13.0**

Result file	Run status
C:/HVVH/OutDir/Solution_CheckRun_7/Current_BOXBEAM_0000.out	Pass

Step 2: Using the Out Compare option.

OUT files generated from the Altair Radioss solver check run can be directly compared.



1. From the **Solution** tab, select ***Check Run***.
2. Activate the ***Out Compare*** option.
3. For **File type**, select ***RADIOSS(Block)***.
4. Under **Input OUT file**, use the file browser icon, , to select and open the following file:

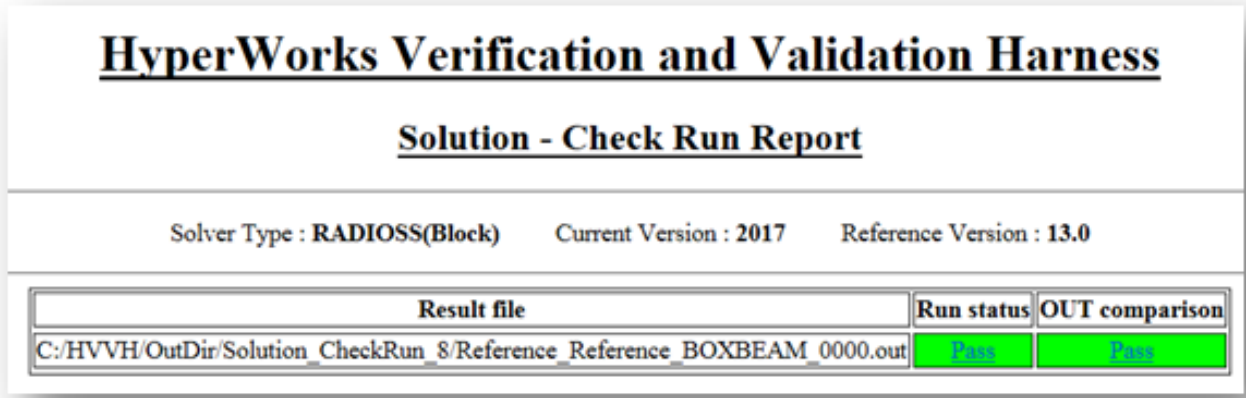
   `..\tutorials\hvvh\Solution\Radioss\Checkrun\Current_BOXBEAM_0000.out`
5. Under **Reference OUT file**, use the file browser icon, , to select and open the following file:

   `..\tutorials\hvvh\Solution\Radioss\Checkrun\Reference_BOXBEAM_0000.out`
6. For the ***Output directory*** field, use the open file icon, , to select an output directory.
7. Click ***Check Run***.

The OUT files selected are compared, including some of the important blocks in the OUT files. More blocks will be added in later versions of HVVH.

After the ***Check run*** (OUT file comparison), the status of the comparison is displayed in the Messages window.

8. In the **Messages** window, the run details are displayed along with the log file location.
9. Differences are indicated with the label **Fail**, otherwise, they are labeled **Pass**.
10. Click ***HTML Report*** to view the HTML report. The comparison of different blocks of results are shown line-by-line. Warnings are in light orange and errors are in dark orange.



HyperWorks Verification and Validation Harness

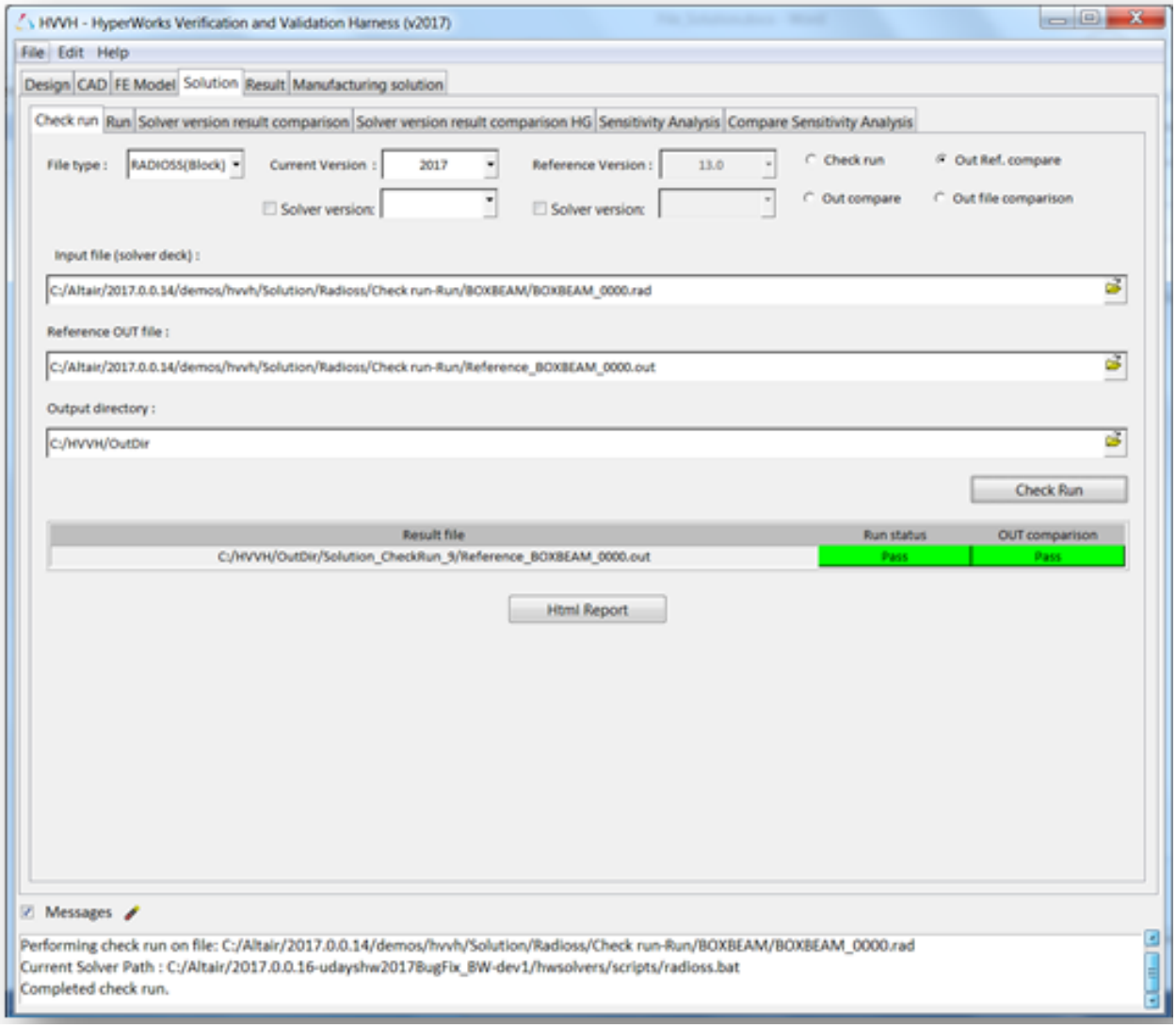
Solution - Check Run Report

Solver Type : **RADIOSS(Block)** Current Version : **2017** Reference Version : **13.0**

Result file	Run status	OUT comparison
C:/HVVH/OutDir/Solution_CheckRun_8/Reference_Reference_BOXBEAM_0000.out	Pass	Pass

Step 3: Use the Out Ref. Compare option.

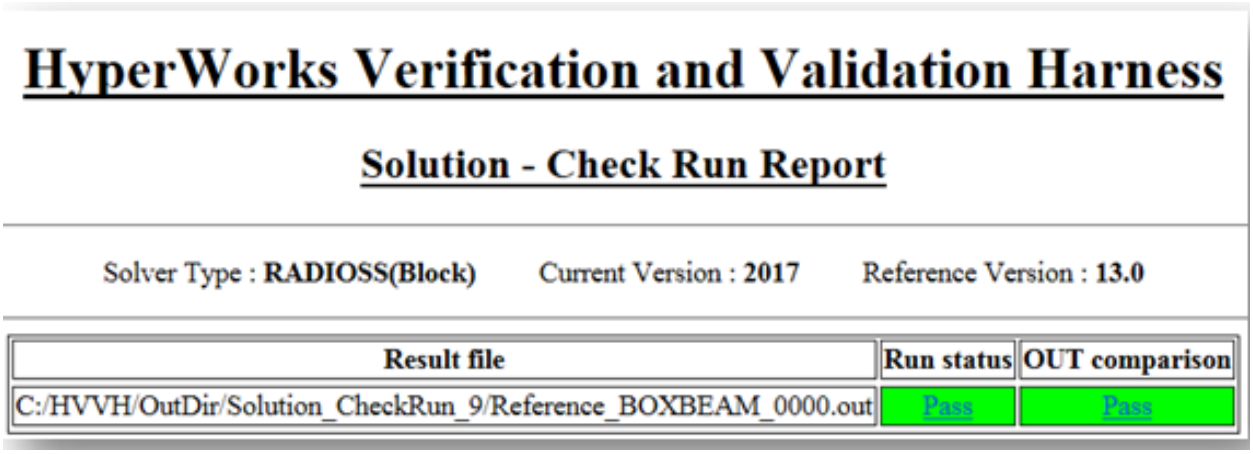
Out files generated from the solver check run can be compared with the reference OUT file.



1. From the **Solution > Check run** tab, activate the ***Out Ref. compare*** option.
2. For **File type**, select ***RADIOSS(Block)***.
3. For ***Current version***, select **2017**.
4. Under **Input file**, use the file browser icon, , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Checkrun\BOXBEAM\BOXBEAM_0000.rad`
   This file is used for the solver run in the background.
5. Under **Reference OUT file**, use the file browser icon, , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Checkrun\Reference_BOXBEAM_0000.out`
   This file is used to compare the first generated OUT file.
6. For the ***Output directory*** field, use the open file icon, , to select an output directory.

7. Click ***Check Run***.

   The generated OUT file and reference OUT files are compared, including some of the important blocks in the OUT files are compared. More blocks will be added in later versions.
8. After the Check run (OUT file comparison) is complete, the status of the comparison is displayed in the **Messages** window.
9. In the **Messages** window, the run details are displayed along with the log file location.
10. Differences are indicated with the label **Fail;** otherwise, they are labeled **Pass**.
11. Click ***HTML Report*** to view the HTML report. The comparison of different blocks of results are shown line-by-line. Warnings are in light orange and errors are in dark orange.



HyperWorks Verification and Validation Harness

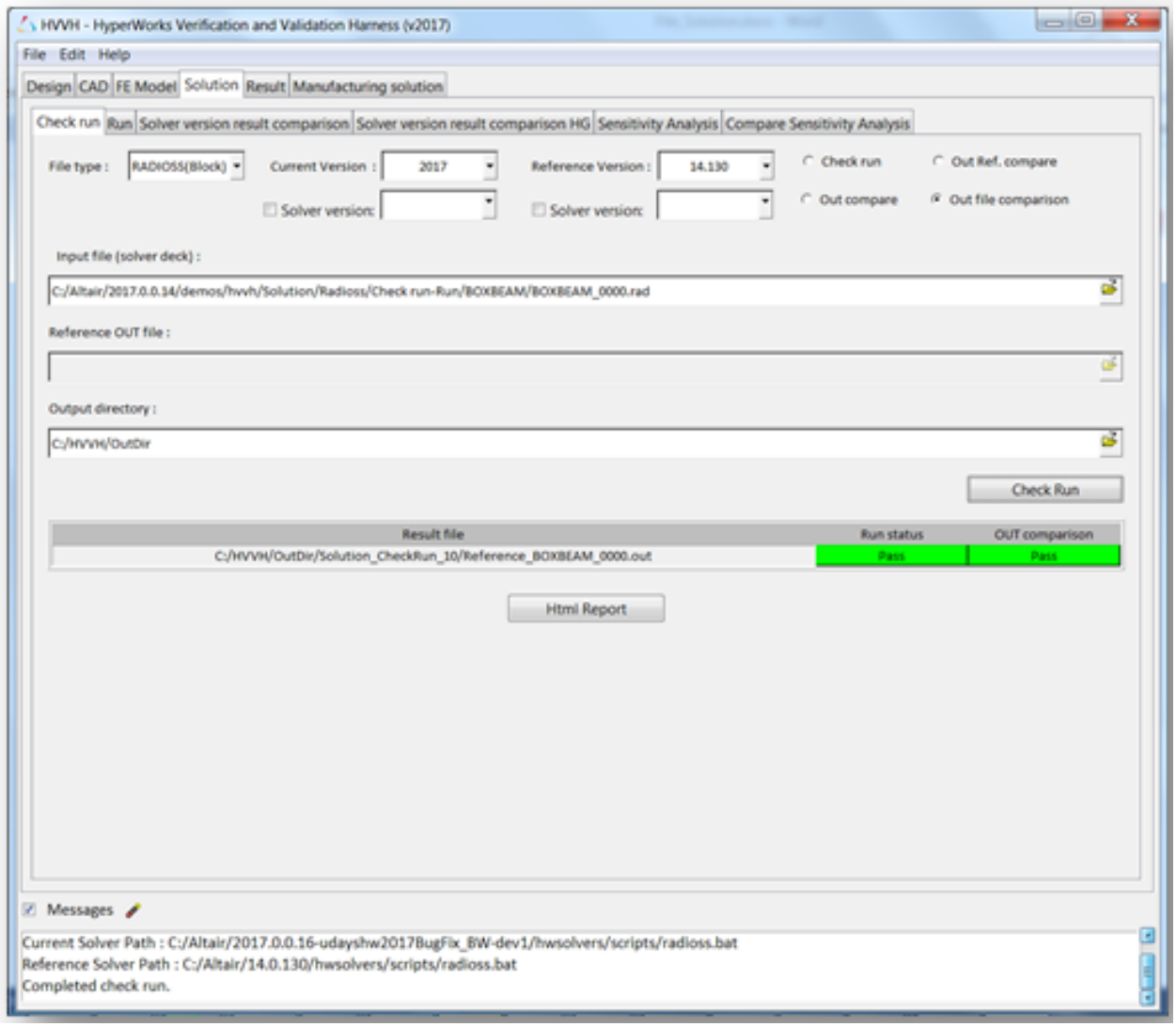
Solution - Check Run Report

Solver Type : **RADIOSS(Block)** Current Version : **2017** Reference Version : **13.0**

Result file	Run status	OUT comparison
C:/HVVH/OutDir/Solution_CheckRun_9/Reference_BOXBEAM_0000.out	Pass	Pass

Step 4: Using the Out file comparison option.

Out files generated from different solver versions can be directly compared.

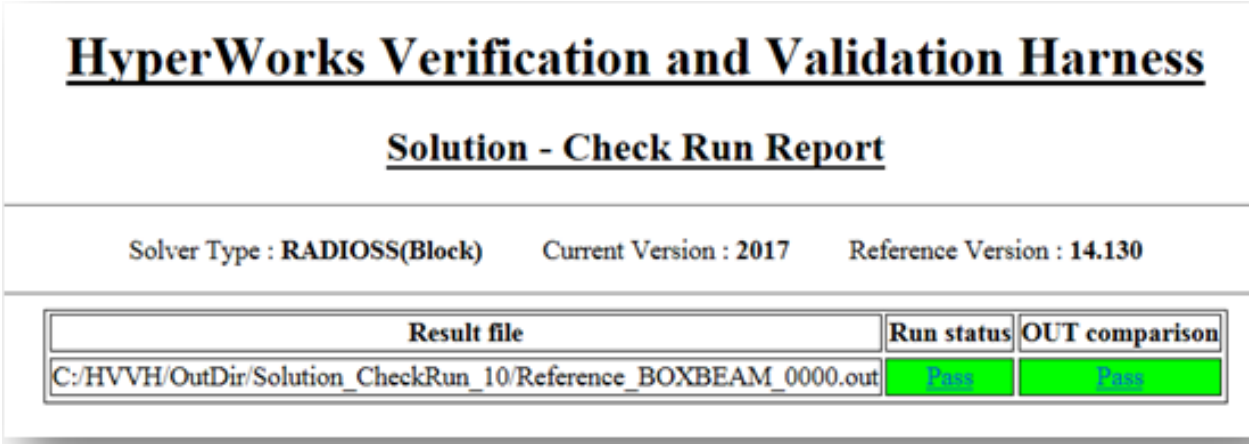


1. From the **Solution > Check run** tab, activate the ***Out file comparison*** option.
2. For **File type**, select ***RADIOSS(Block)***.
3. For **Current version**, select **2017**.
4. For **Reference version**, select **14.130**.
5. Under **Input file**, use the file browser icon,  , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Checkrun\BOXBEAM\BOXBEAM_0000.rad`

   This is the solver file that will be used to run the solver for the check run. The OUT file is created in the output directory.
6. For the ***Output directory*** field, use the open file icon,  , to select an output directory.
7. Click ***Check Run***.

   The generated OUT files are compared, including some of the important blocks in the OUT files. More blocks will be added in later versions.

8. After the check run (OUT file comparison) is complete, the status of the comparison is displayed in the **Messages** window.
9. In the **Messages** window, the run details are displayed along with the log file location.
10. Differences are indicated with the label **Fail;** otherwise, they are labeled **Pass**.
11. Click ***HTML Report*** to view the HTML report. The comparison of different blocks of results are shown line-by-line. Warnings are in light orange and errors are in dark orange.



HyperWorks Verification and Validation Harness

Solution - Check Run Report

Solver Type : **RADIOSS(Block)** Current Version : **2017** Reference Version : **14.130**

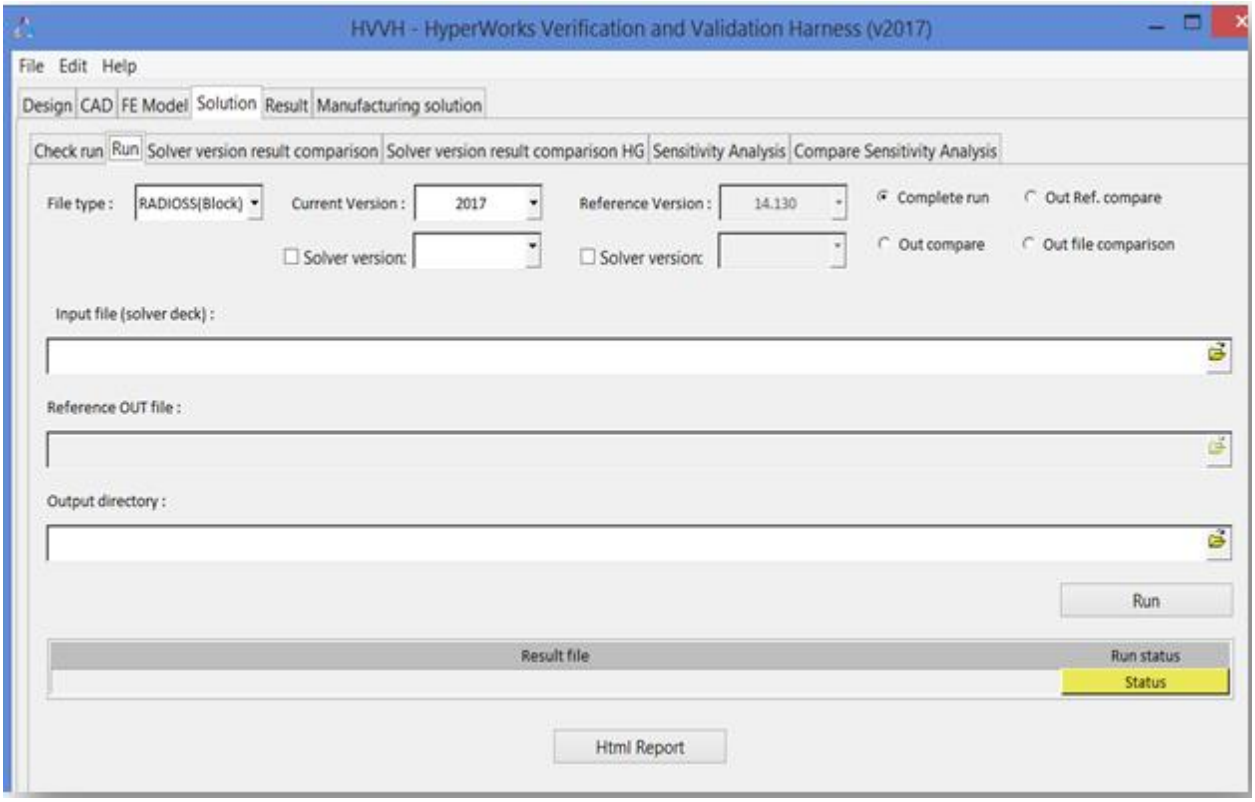
Result file	Run status	OUT comparison
C:/HVVH/OutDir/Solution_CheckRun_10/Reference_BOXBEAM_0000.out	Pass	Pass

Step 5: Solver run.

After a complete solver run, you can compare OUT files for solver-written result files.

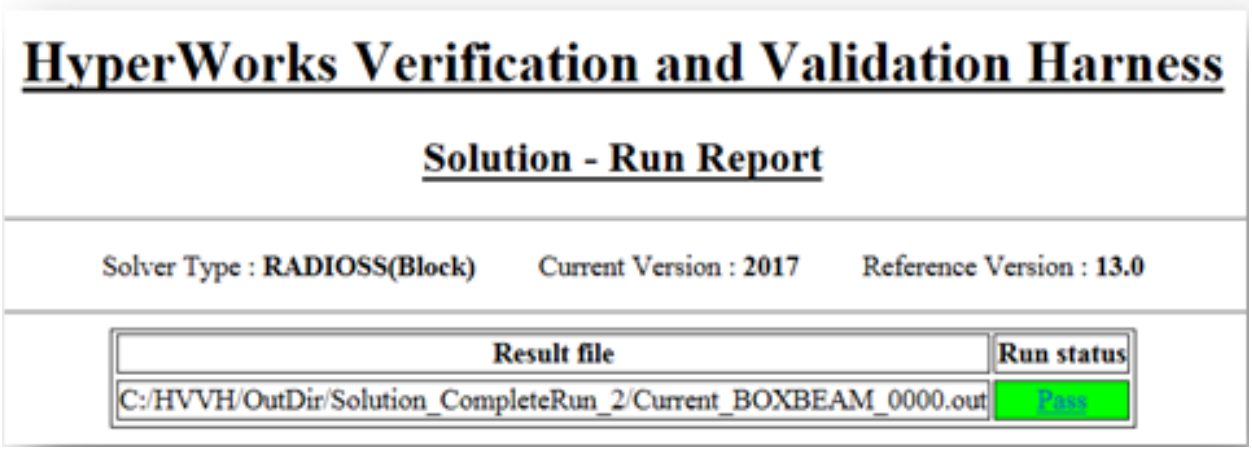
Three options are available for the OUT file comparison under the ***Run*** option of the solver.

1. Two OUT files generated from the solver run can be compared.
2. The current solver run OUT file can be compared with the reference OUT file.
3. Two OUT files generated from the same solver deck using two different solver versions can be compared.



Begin the tutorial:

1. From the **Solution > Run** tab, activate the ***Complete run*** option.
2. For **File type**, select ***RADIOSS(Block)***.
3. For ***Current version***, select **2017**.
4. Under **Input file**, use the file browser icon,  , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Run\BOXBEAM\BOXBEAM_0000.rad`
   This file is used for the solver run in the background.
5. For the ***Output directory*** field, use the open file icon,  , to select an output directory.
6. Click ***Run***.
   After the run is complete, the status of the comparison is displayed in the **Messages** window.
7. In the **Messages** window, the run details are displayed along with the log file location.
8. Errors are indicated with the label **Fail;** otherwise, they are labeled **Pass**.
9. Click ***HTML Report*** to view the HTML report.



HyperWorks Verification and Validation Harness

Solution - Run Report

Solver Type : **RADIOSS(Block)** Current Version : **2017** Reference Version : **13.0**

Result file	Run status
C:/HVVH/OutDir/Solution_CompleteRun_2/Current_BOXBEAM_0000.out	Pass

10. The following three options on the Run tab work as they do on the Check run tab (see Steps 2-4 above).
    - Out compare (out files comparison)
    - Out Ref. compare (out files comparison)
    - Out file comparison from solver check runs

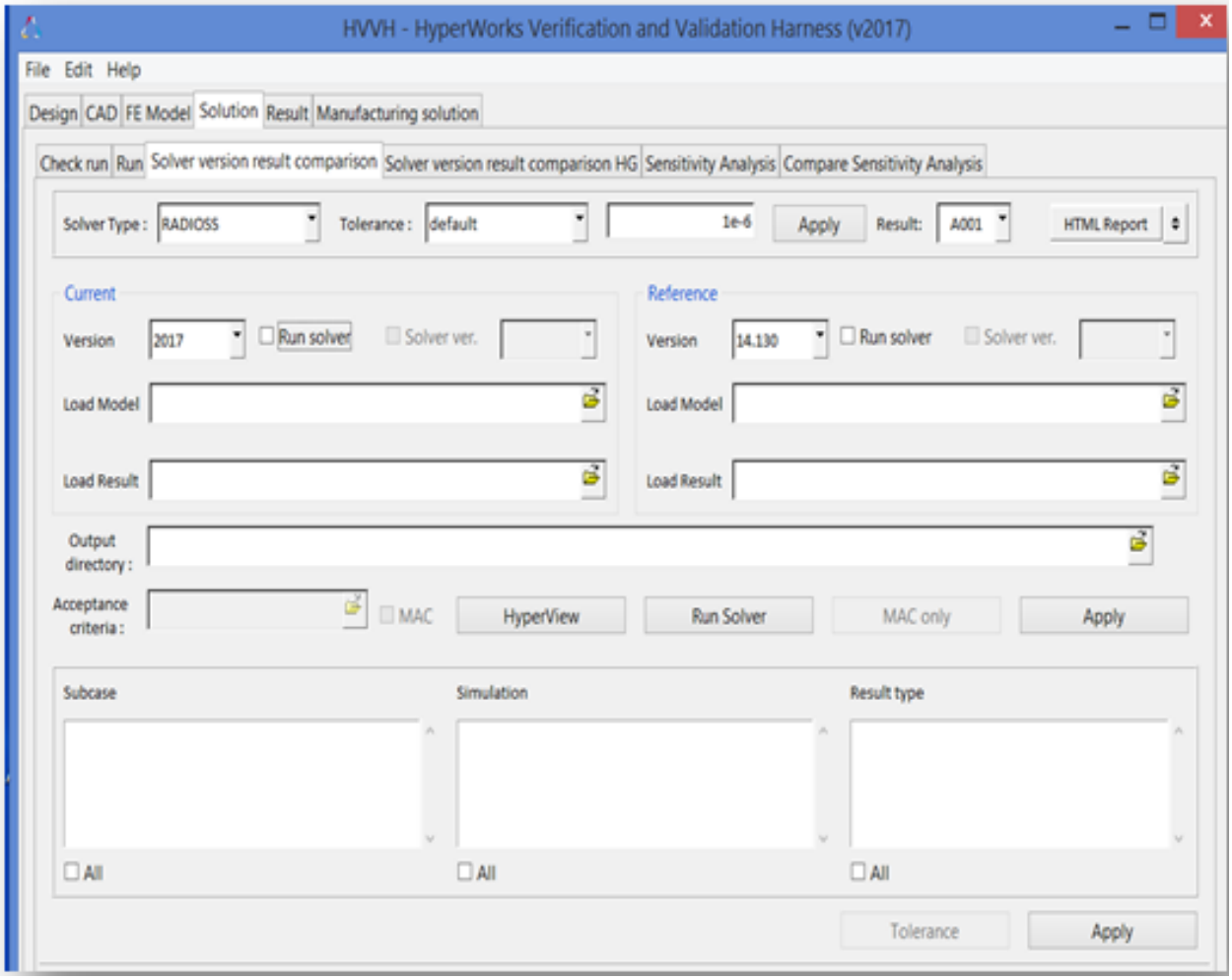
    For Altair Radioss, both the Starter OUT file and Engine OUT files are compared.

    For Altair OptiStruct, the OUT files are compared.

Step 6: Solver version result comparison (Altair Radioss or Altair OptiStruct)

In this section, you will use the Solver version result comparison option for a given model. If the result files are not available, the Solver Run can be done in the background and the result generated are used in the result comparison.

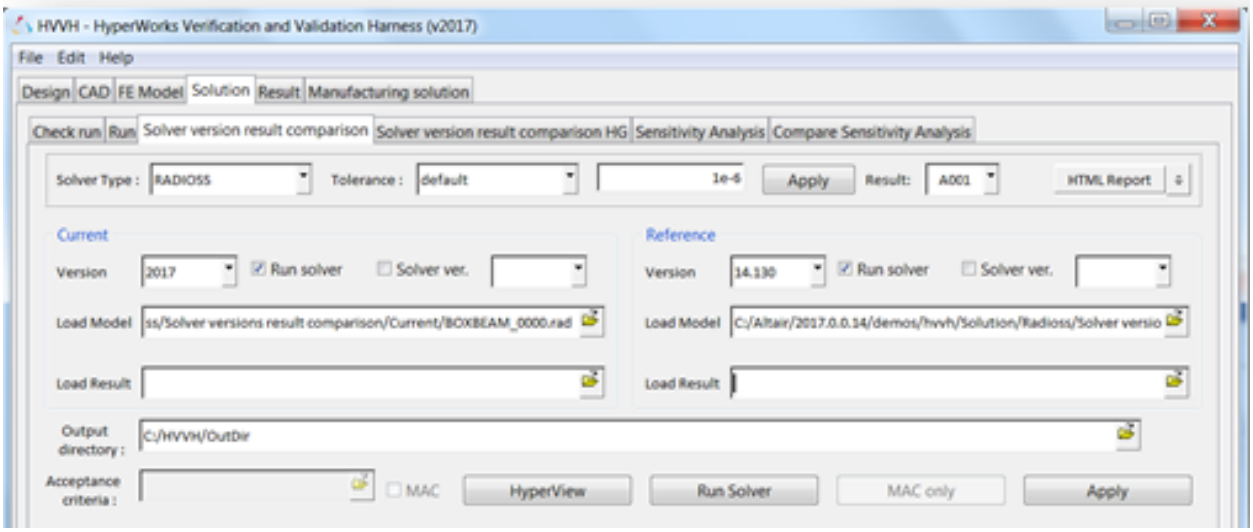
1. From the ***Solution*** tab, select the ***Solver version result comparison*** tab.



2. For **Solver type**, select ***RADIOSS***.
3. For **Tolerance**, select the default (1e-06). You can set any tolerance for Scalar, Vector, or Tensor data types.
4. For **Result**, select ***A001***.
5. Click ***HTML Report***.
6. Under **Current**, for ***Load Model***, use the file browser icon, , to select and open the following file:

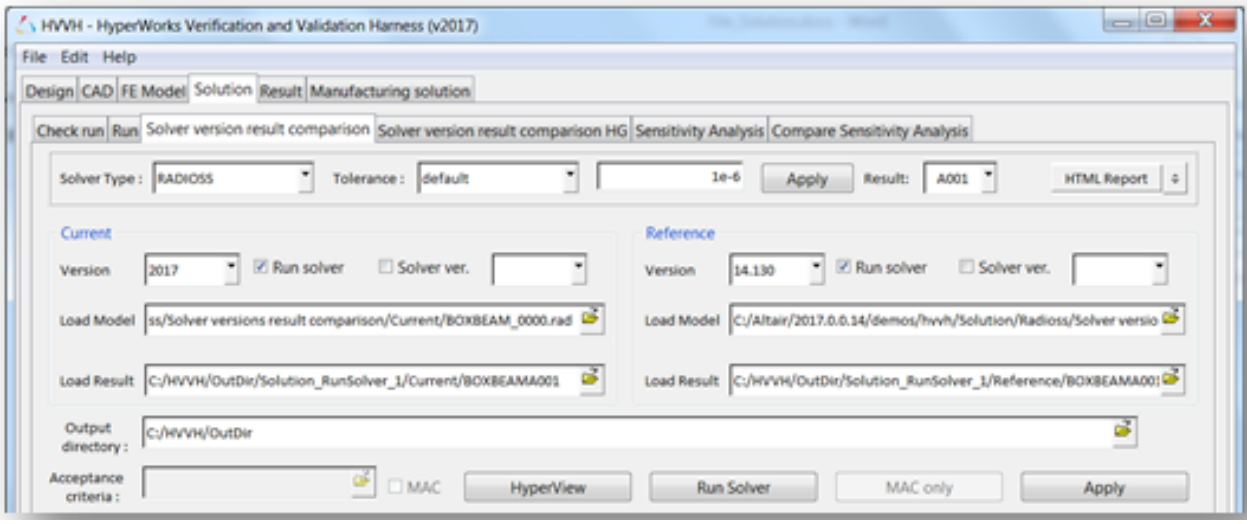
   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison\Current\BOXBEAM_0000.rad file`.
7. Under **Reference**, for ***Load Model***, use the file browser icon, , to select and open the following file:

   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison\Reference\BOXBEAM_0000.rad file`.
8. For the ***Output directory*** field, use the open file icon, , to select an output directory.



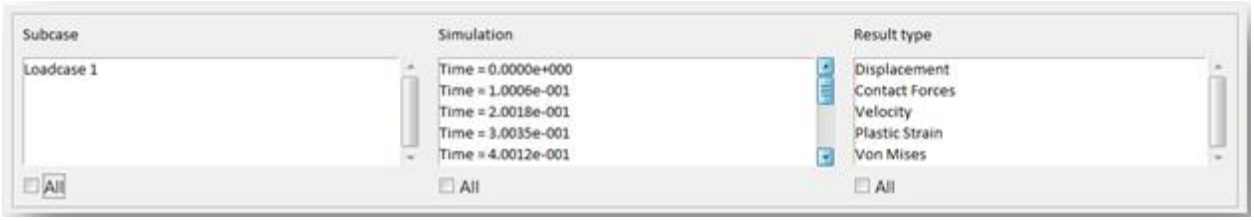
9. Activate the ***Run solver*** options.
10. Click ***Run Solver***.

    After the solver run, the A001 results are loaded in the ***Load Result*** option.



11. Click ***Apply***.

    The results available (Subcase, Simulation, and Result type) in the current result file are loaded in the three windows.

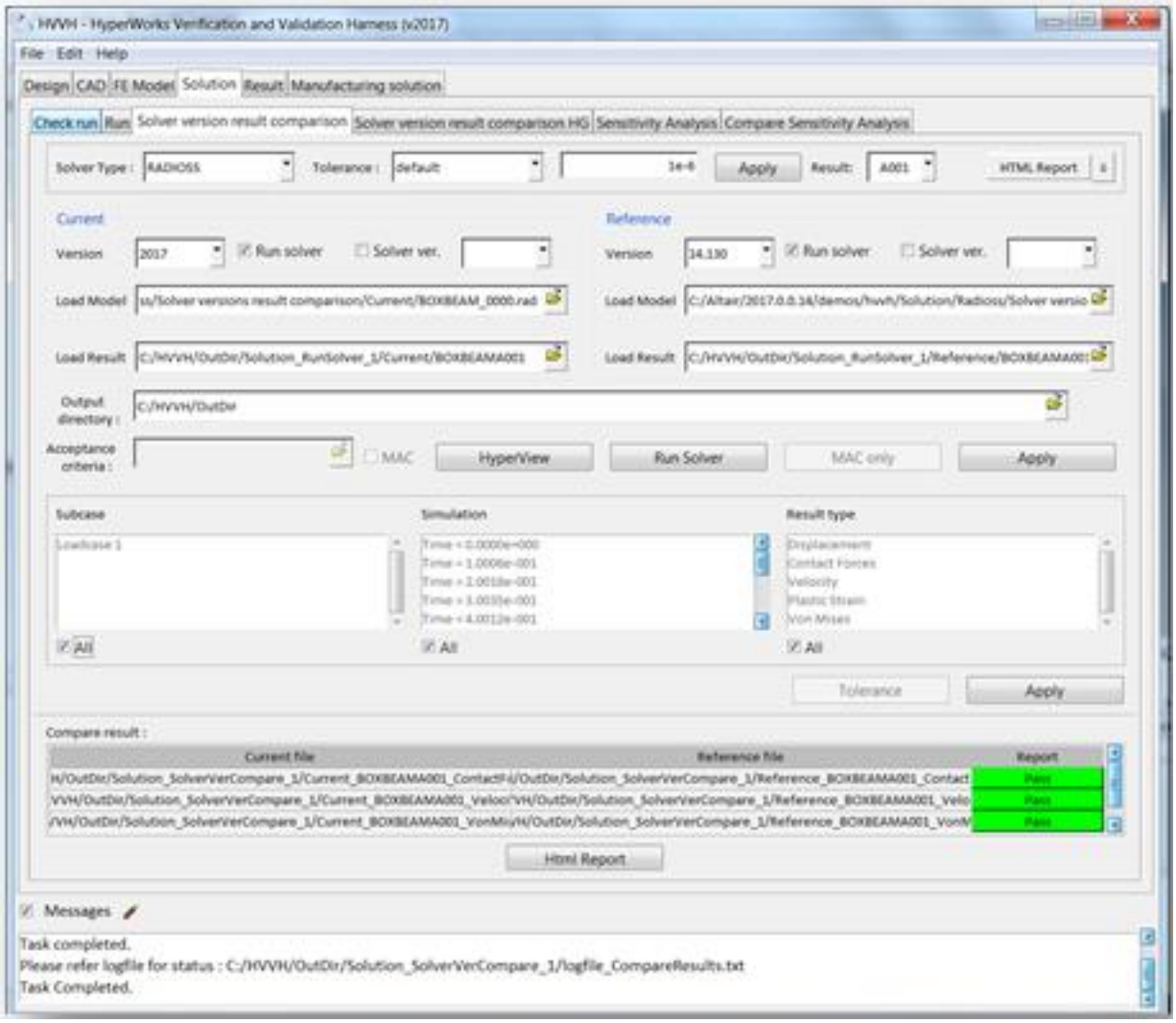


12. Select each ***All*** under each of the windows and click the second ***Apply*** button.

    Any combination of Subcase, Simulation, and Datatype can be selected for comparison.

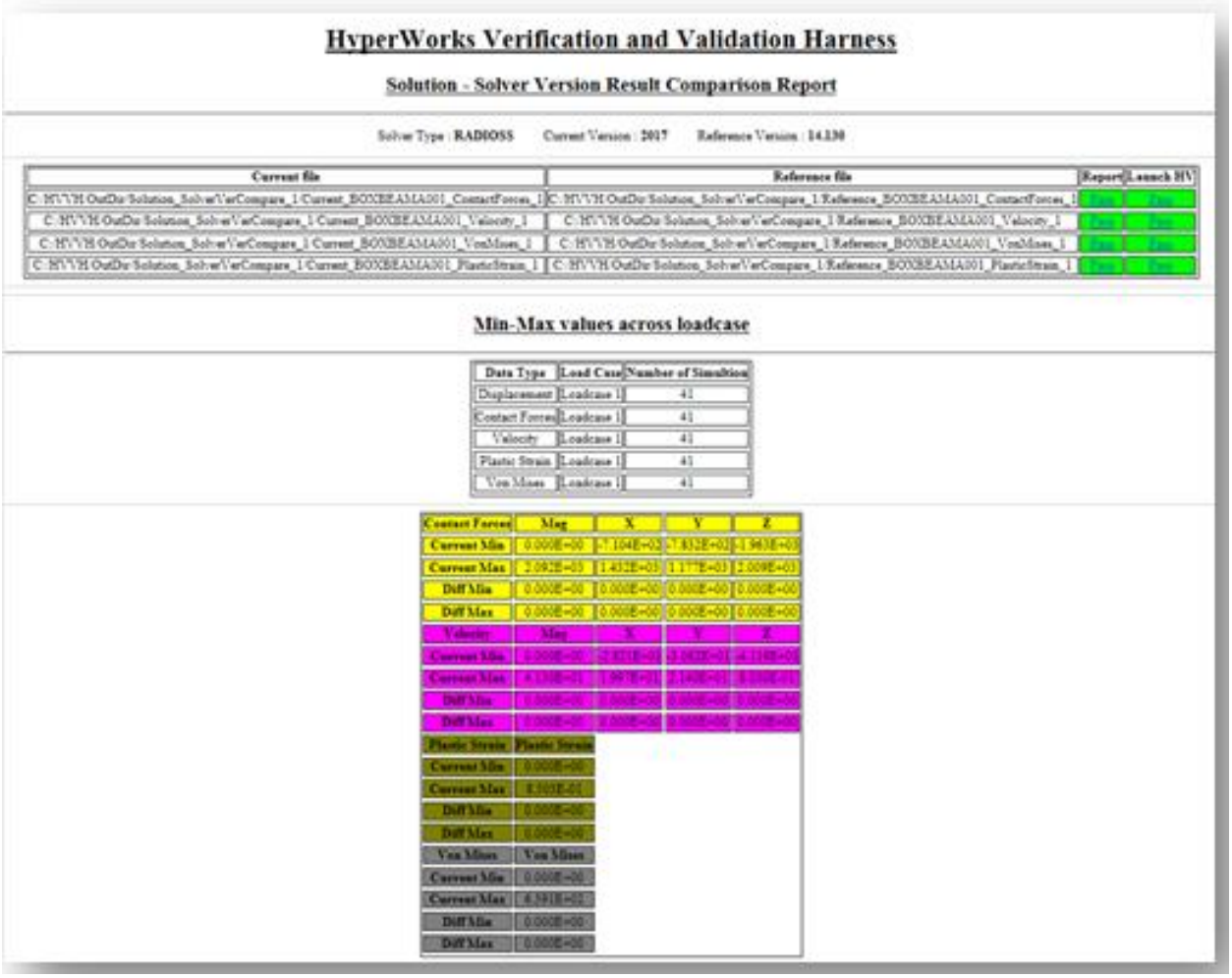
    Results comparison of the current and reference results are generated.

13. In the **Messages** window, the run details are displayed along with the log file location.
14. If any difference is greater than the tolerance, it is indicated with the label **Fail**, otherwise, they are labeled **Pass**.



15. Click ***HTML Report*** to view the HTML report. Comparisons between different data types are available.

    For example, for a vector (Displacement), the components Magnitude, X-displacement, Y-displacement, and Z-displacement are compared for the entire model and results are displayed.

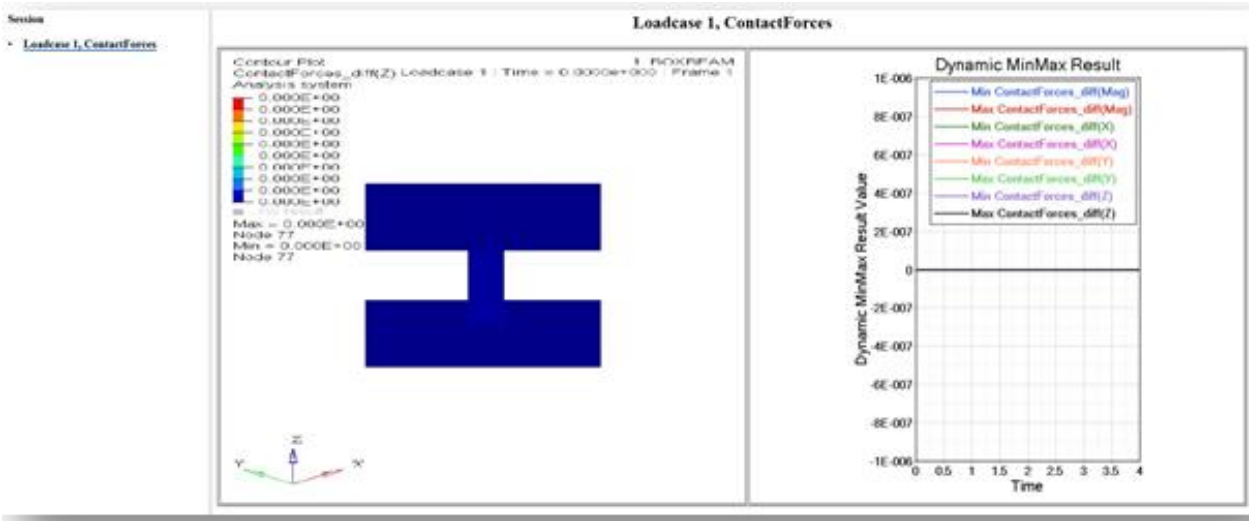


16. Click **Pass/Fail** in the HTML report to open a detailed comparison report.

    The second column in the table, **Launch HV**, opens Altair HyperView. Depending on the data type, different windows are opened with the respective diff results.

    For example, for vector results (Displacement), four windows open with the Magnitude, Displacement –X, Displacement –Y, and Displacement –Z loaded in the different windows. In each window, further details can be viewed.

17. Click the first column of the table to open a new graphics window.



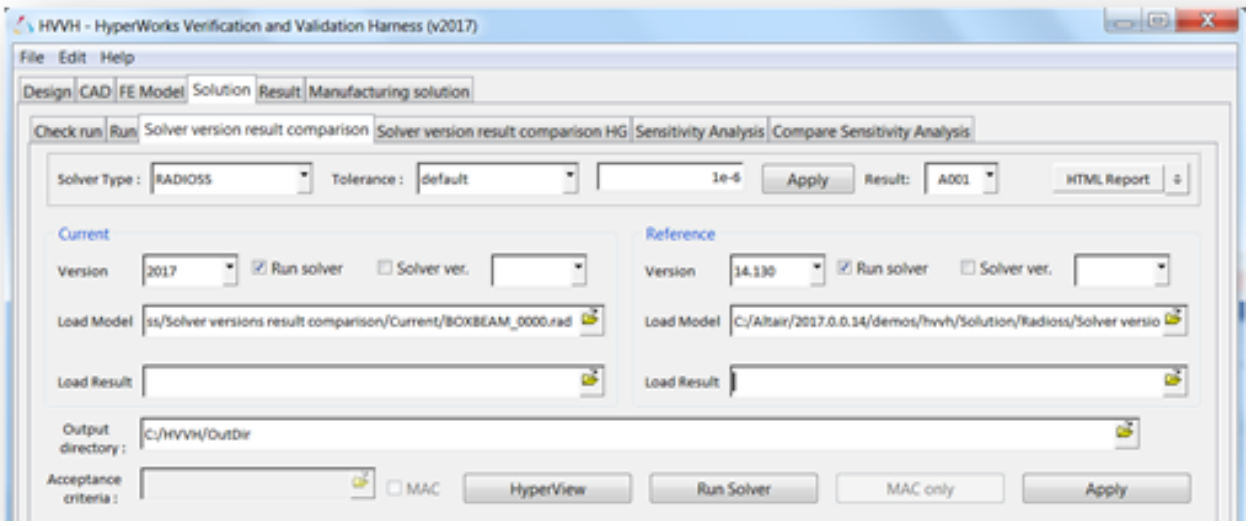
In the image above, the left window shows a diff contour (Current-Reference) and the right window shows a diff plot in Altair HyperGraph.

18. In case any difference is greater than the tolerance, it is indicated with the label **Fail**, otherwise, it is labeled **Pass**.
19. Click the left window to open the diff-values H3D in HyperView Player. You can view the difference in the contour and view the area where there is a difference in case of a failure.
20. Click the right window to maximize/minimize the plot. The difference values for each step are calculated and the min and max values of the difference are plotted.

    If all the values match and no difference is seen, the curve is a flat line and the diff contours have values less than the tolerance.

Step 7: Solver version result comparison (Altair HyperView option - Altair HyperView interactive)

1. From the **Solution** tab, select the ***Solver version result comparison*** tab.



2. For the **Solver Type**, select ***RADIOSS***.
3. For ***Tolerance***, select the default (1e-06). You can set any tolerance for the Scalar, Vector or Tensor data types
4. For **Result**, select ***A001***.
5. Click **HTML Report**.
6. For **Current Version**, select ***2017***.
7. For **Reference Version**, select ***14.130***.
8. Under **Current**, for **Load Model**, use the file browser icon, , to select and open the following file:

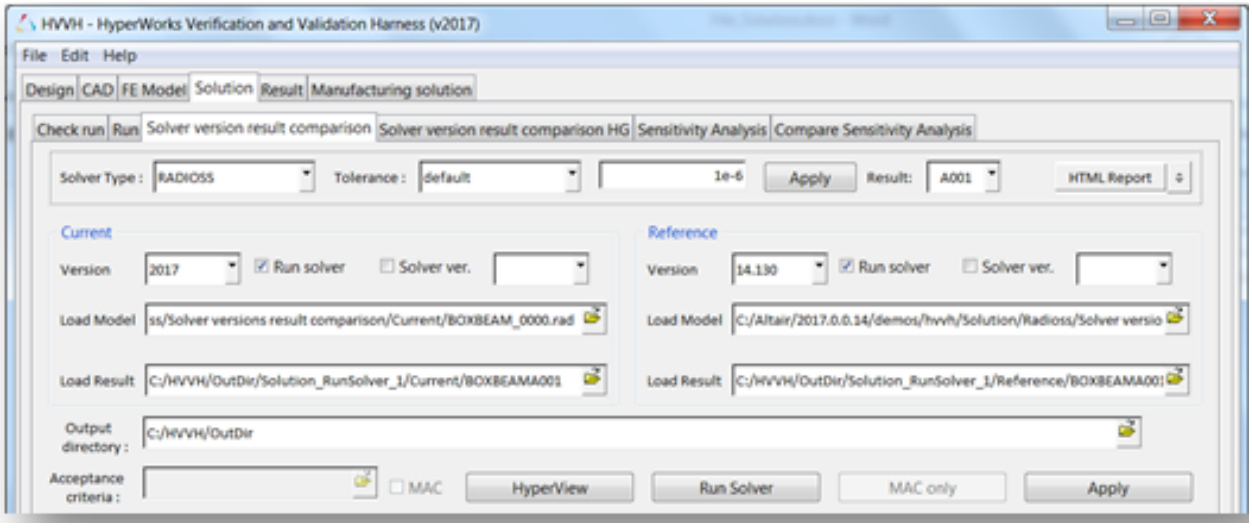
   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison\Current\BOXBEAM_0000.rad`

9. Under **Reference**, for **Load Model**, use the file browser icon, , to select and open the following file:

   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison\Reference\BOXBEAM_0000.rad`

10. For the ***Output directory*** field, use the open file icon, , to select an output directory.
11. Activate the ***Run solver*** options.
12. Click ***Run Solver***.]

    After the solver run, the A001 results are loaded in the ***Load Result*** option.

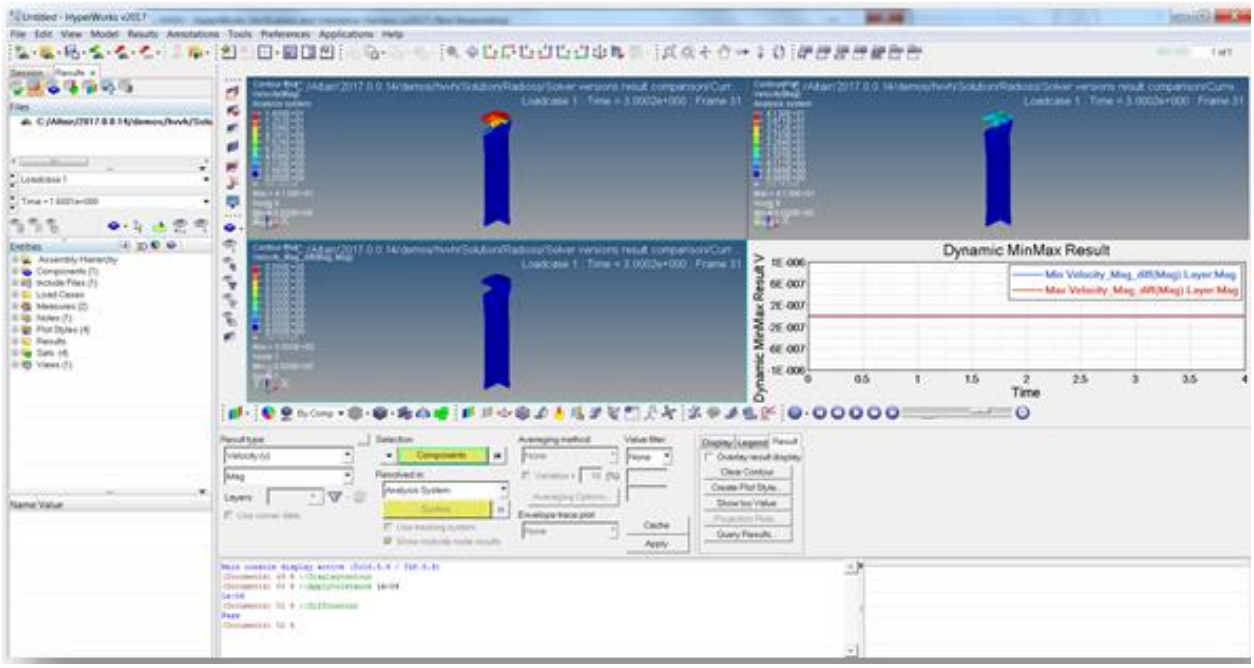


13. Click ***HyperView***.

    Altair Hyperview opens the current results and reference results and loads them into two windows.

14. Model and results are pre-loaded for both the current and reference models in Altair HyperView. From the Contour panel, select data type and data component.
15. Control is active for first window.

- Select a region of interest (element, node, component level) and create a contour.
- Run the command **::Displaycontour** (reference result contour is also loaded for the selected region).
- Run a command to apply a user-defined tolerance for the data type selected **::Applytolerance** (otherwise, use the default tolerance).
- Run the command **::Diffcontour**. Difference contour result are displayed in another window for the selected data types only and are also plotted.



16. The first window displays the current model and result, and the second window displays reference model and result.
17. The third window displays the difference in the contour values. If the difference is greater than the tolerance, it is indicated as **Fail**, otherwise its displayed as ***Pass***.
18. The fourth window displays the actual diff plots in HyperGraph.

    The data type can be changed and any individual component result can be compared. Tolerance values can be reset to any value and result comparison.

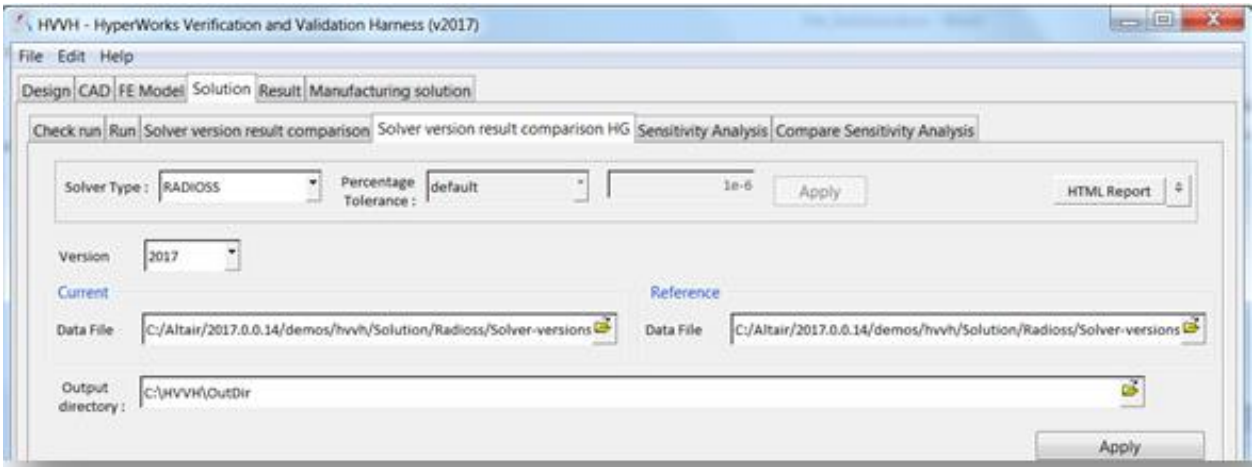
Comparison for region of interest:

- Part of the model (by window, by component, set of elements, and so on) can be selected in the first window. Using APIs as mentioned above, results can be compared ONLY for the selected region.

Step 8: Solver version result comparison HG

In this step, you will compare results from different solver versions (Altair Radioss or Altair OptiStruct) using Altair HyperGraph.

1. From the **Solution** tab, select ***Solver version result comparison HG***.



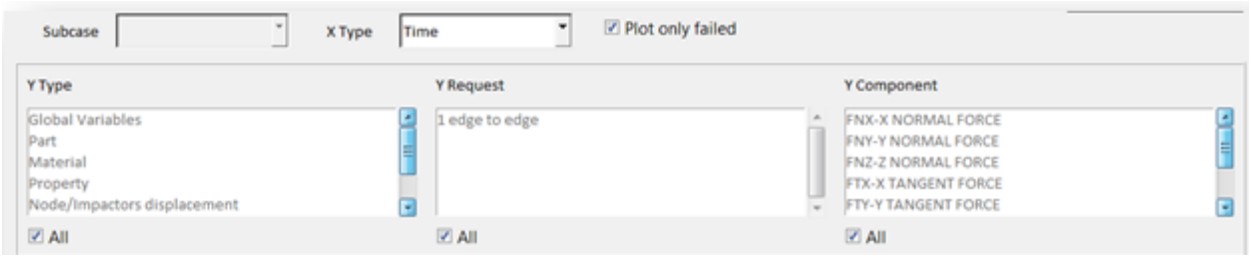
2. For **Solver Type**, select ***RADIOSS***.
3. Click ***HTML Report***.
4. For **Version**, select ***2017***.
5. Under **Current**, for **Data File**, use the file browser icon, , to select and open the following file:

   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison-HG\Current_BOXBEAMT01`

6. Under **Reference**, for **Data File**, use the file browser icon, , to select and open the following file:

   `..\tutorials\hvvh\Solution\Radioss\Solver-versions-result-comparison-HG\Reference_BOXBEAMT01`

7. For the ***Output directory*** field, use the open file icon, , to select an output directory.
8. Click ***Apply***.



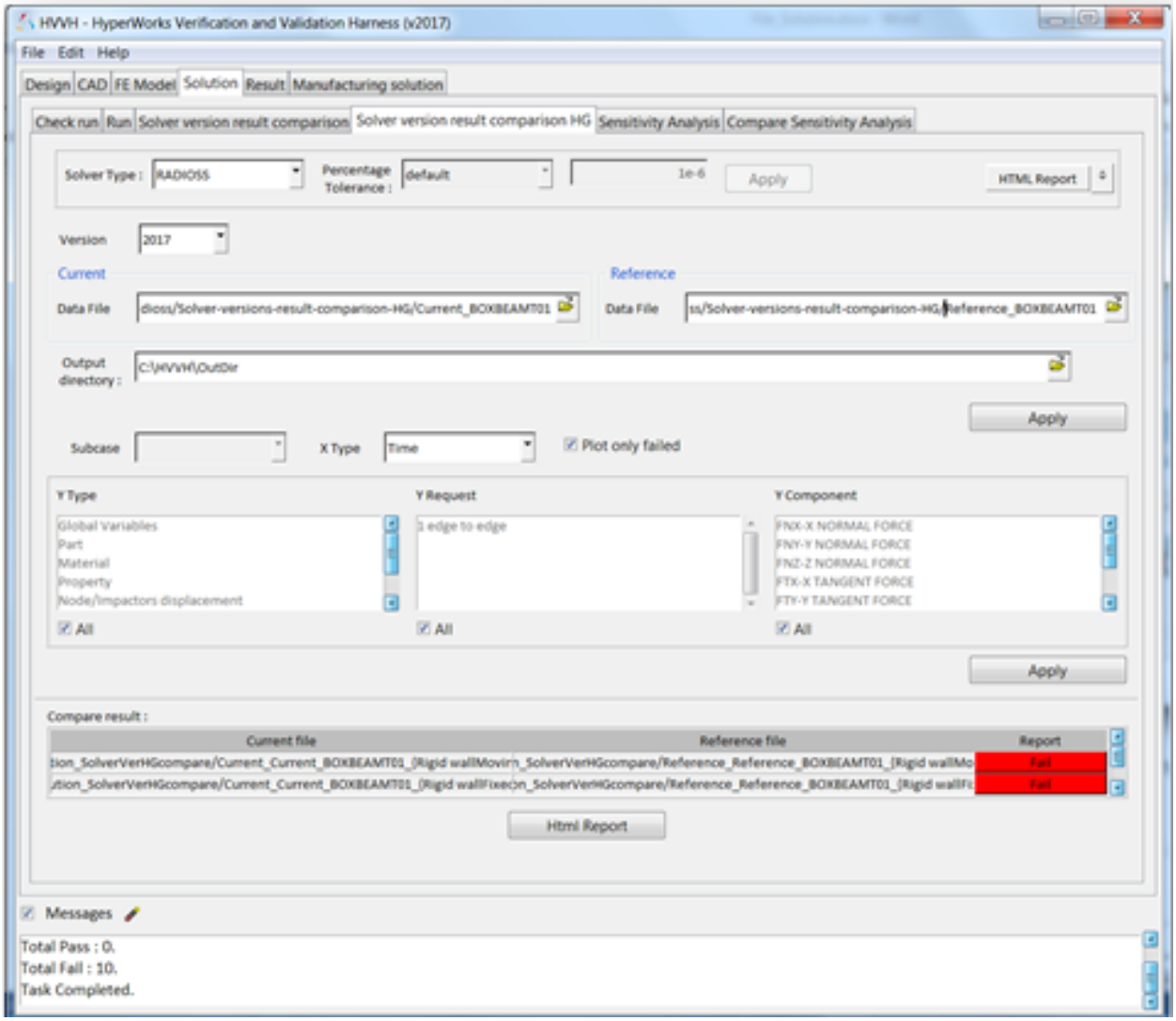
9. Select each ***All*** and click the second ***Apply***.

   Any combination of the Y-Type, Y Request, and Y Component can be selected for comparison.

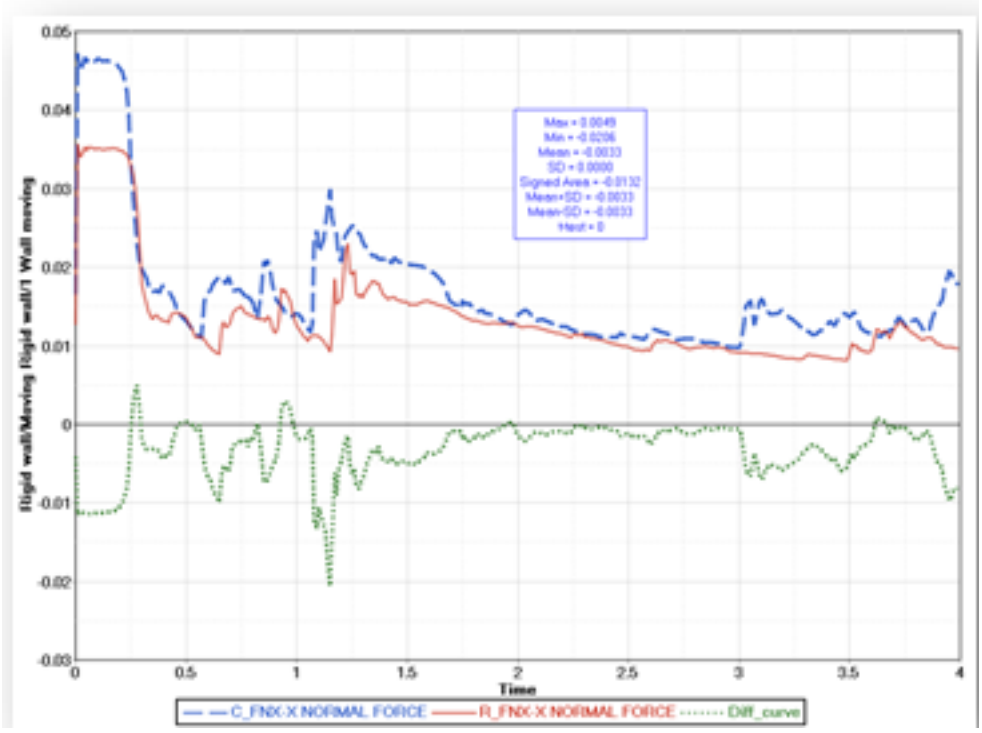
10. In this example, the solver result for the same model with *slightly different* Boundary conditions are picked to show the difference in the results so that they are visible in the graphs of the report.

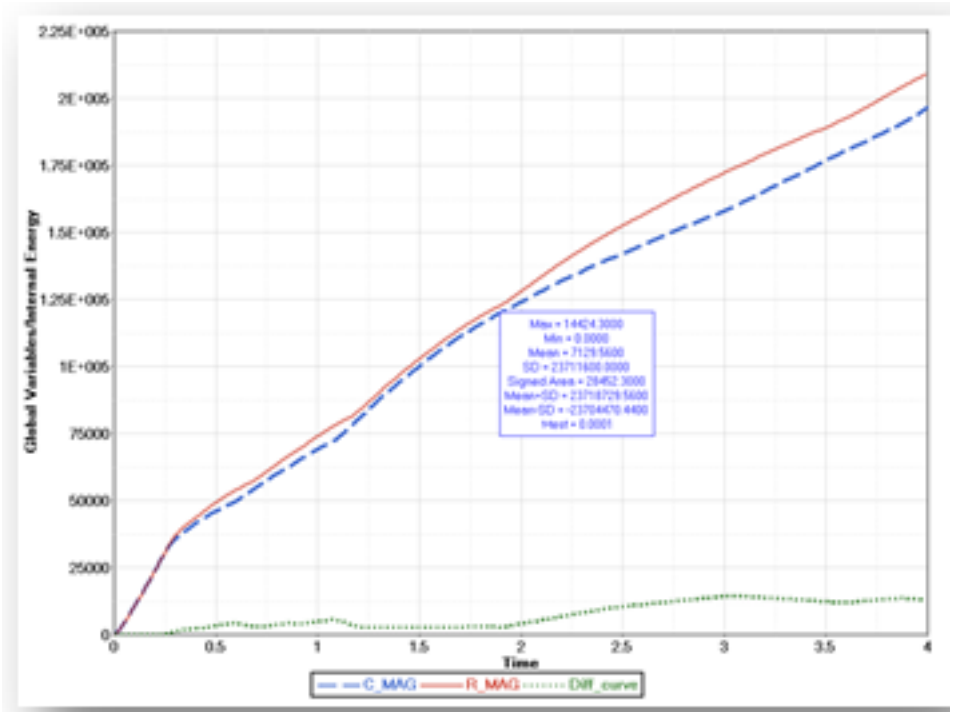
    Results comparison of the current results and reference plot results are generated.

11. In the **Messages** window, the run details are displayed along with the log file location.



12. Click ***HTML Report*** to open the report. Comparison of different Types, Requests, and Components (TRC) are available.





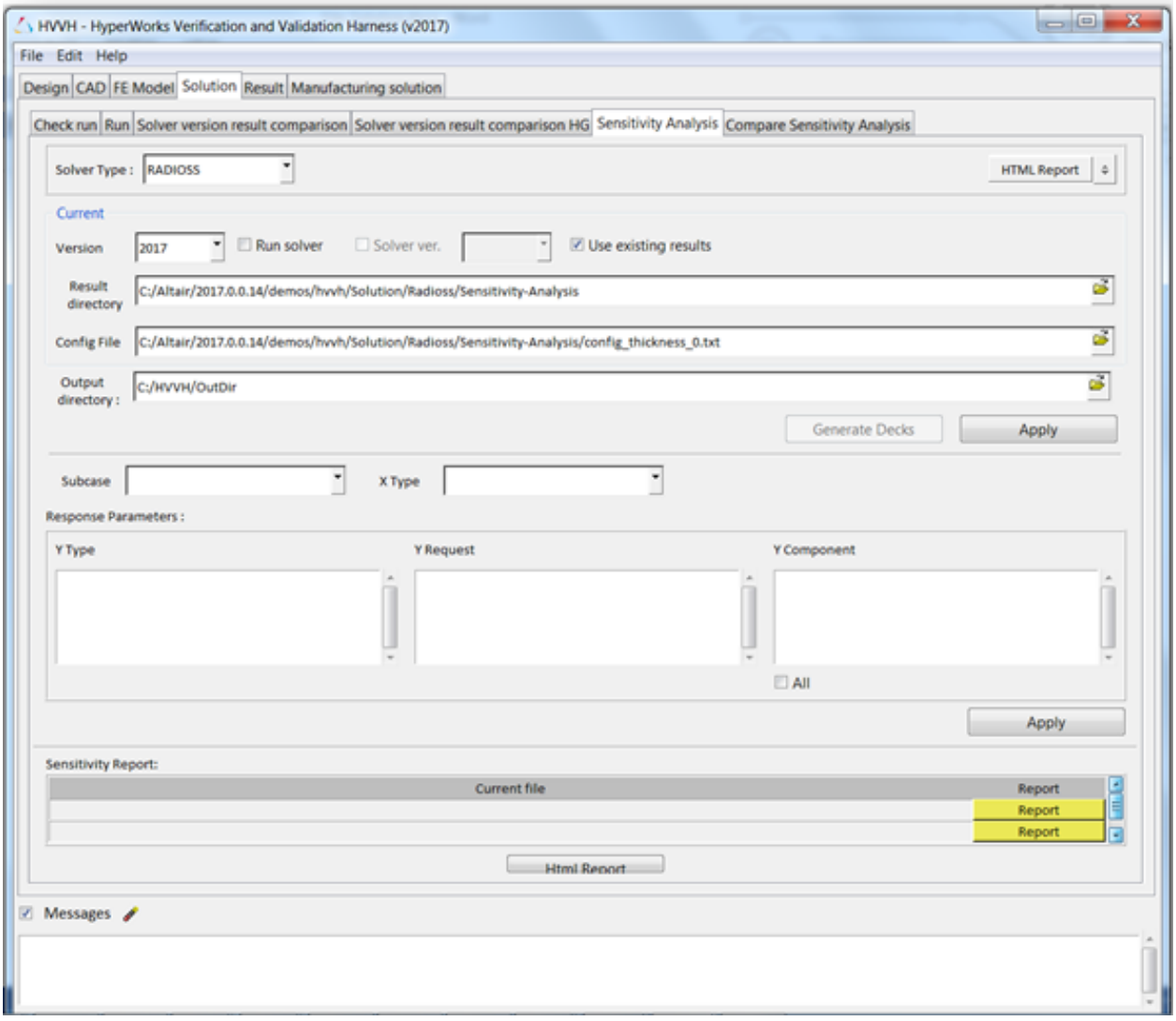
13. Click the ***Fail in HTML*** report to open a detailed comparison report.
    Here, the boundary conditions are different and there is a difference in results.
14. Click on the plots to maximize/minimize the images.
15. Graphs display the current and reference curves along with the difference curve.

16. The diff curve shows differences in current/reference curves. Any non-zero diff value is a failure.
17. All statistical details of the difference curve is also shown in the graph table.

Step 9: Sensitivity Analysis.

Compare results from different solver versions (Altair Radioss or Altair Optistruct) using Sensitivity Analysis. Sensitivity analysis of the model is carried out for different seed values.

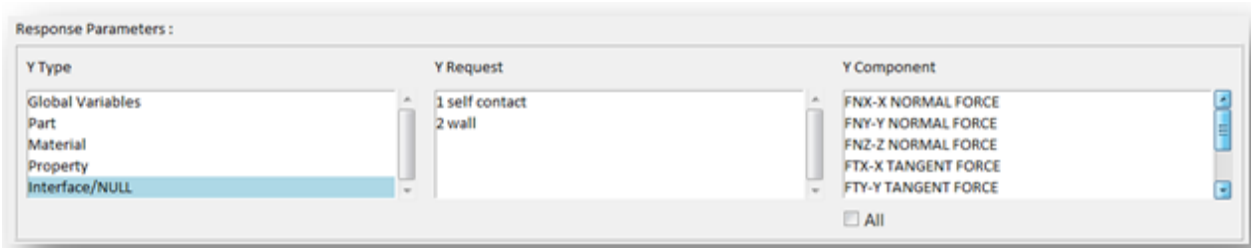
1. From the **Solution** tab, select the ***Sensitivity Analysis*** tab.



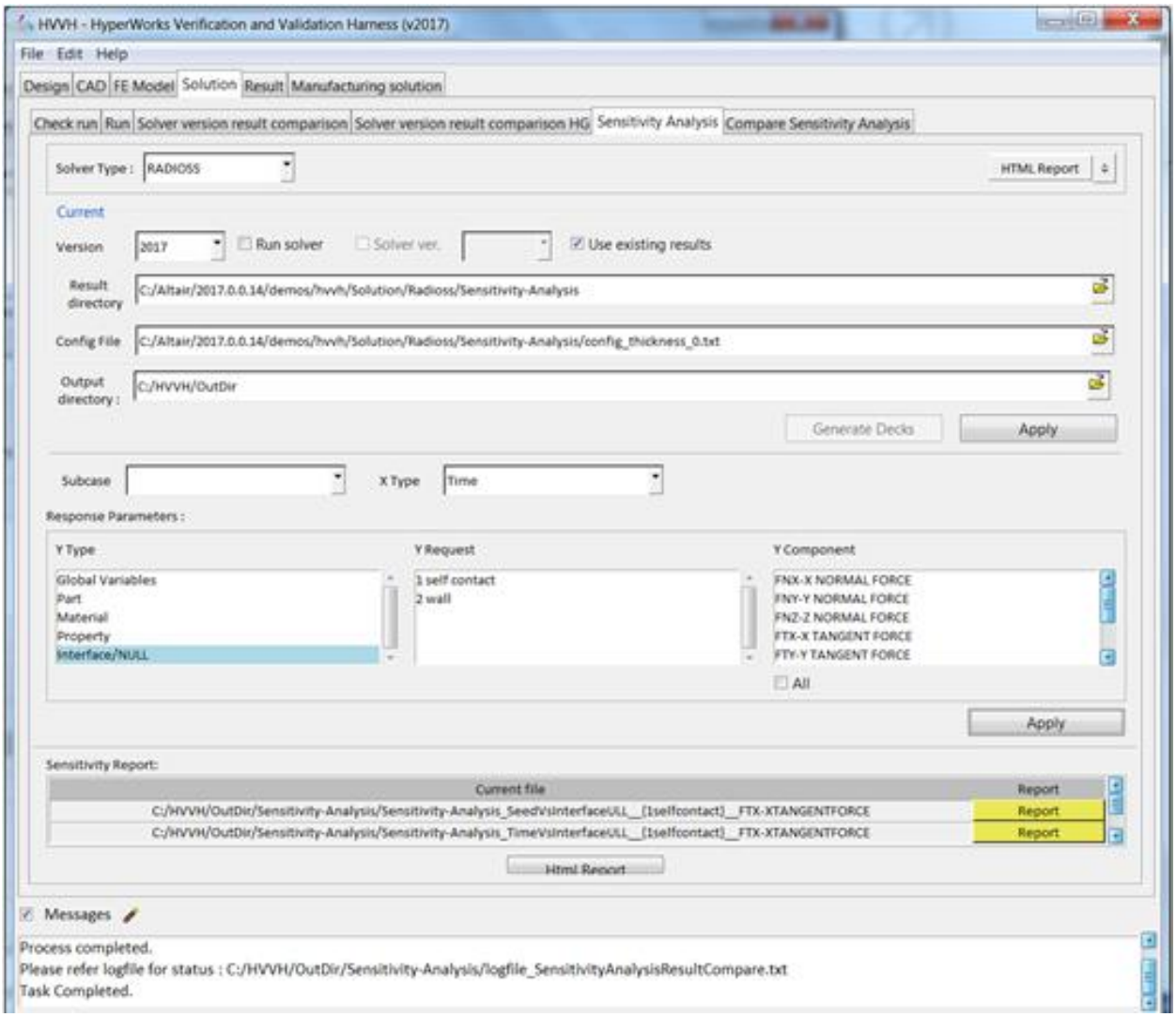
2. For **Solver Type**, select ***RADIOSS***.
3. Click ***HTML Report***.
4. For **Version**, select ***2017***.
5. Activate the ***Use existing results*** option.

   The results of from a previously run solver analysis is used.

6. For **Result directory**, use the file browser icon, , to browse here:
   `..\tutorials\hvvh\Solution\Radioss\Sensitivity-Analysis`
7. For **Config File**, use the file browser icon, , to select and open the following file:
   `..\tutorials\hvvh\Solution\Radioss\Sensitivity-Analysis\config_thickness_0.txt`
   This file is used to set different seed values for the sensitivity analysis.
8. For the ***Output directory*** field, use the open file icon, , to select an output directory.
9. Click ***Apply***.



10. Under **Response Parameters**, select TRCs for the sensitivity study and click ***Apply***.
    The sensitivity report is generated.
11. In the **Messages** window, the run details are displayed along with the log file location.



12. Click ***HTML Report*** to open the sensitivity report.
13. In the HTML report for one TRC, there will be two reports.

    1. Seed Vs TRC.

    This is a scattered plot, showing sensitivity for each seed value. This creates a sensitivity corridor that can be used to study the variation or sensitivity of the result for the given model.

    2. Time Vs TRC.

    This shows:

    - All Time History (TH) plots across the seed values.

    - Envelope cures (Max, Min, Mean, SD, Mean+SD, and Mean-SD).

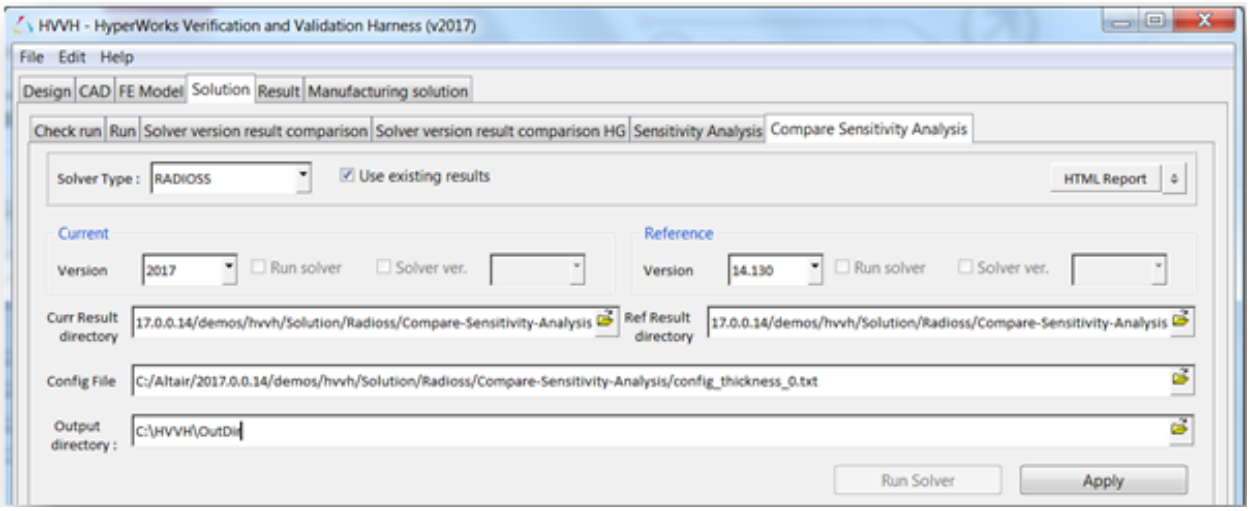
    - Statistical curves (Max, Min, Mean, SD, Mean+SD, and Mean-SD).

    The detailed report points to different sets of information to help you further assess the results and perform the sensitivity study, and if this model can be used further for solver version result comparisons.

Step 10: Compare results from different Solver versions (Altair Radioss or Altair OptiStruct) using Sensitivity analysis.

Actual solver version result comparison for solver plot results using this sensitivity analysis, carried out using different solver versions for the same model.

1. From the **Solution** tab, select the ***Compare Sensitivity Analysis*** tab.



2. For **Solver Type**, select ***RADIOSS***.
3. Activate the ***Use existing results*** option.
4. Click ***HTML Report.***
5. For **Current Version**, select ***2017.***
6. For **Reference Version**, select ***14.130.***
7. For **Current Result directory**, use the file browser icon, , to browse to the following location:

   `..\tutorials\hvvh\Solution\Radioss\Compare-Sensitivity-Analysis`

8. For **Reference Result directory**, use the file browser icon, , to browse to the following location:

   `..\tutorials\hvvh\Solution\Radioss\Compare-Sensitivity-Analysis`

9. For **Config File**, use the file browser icon, , to select and open the following file:

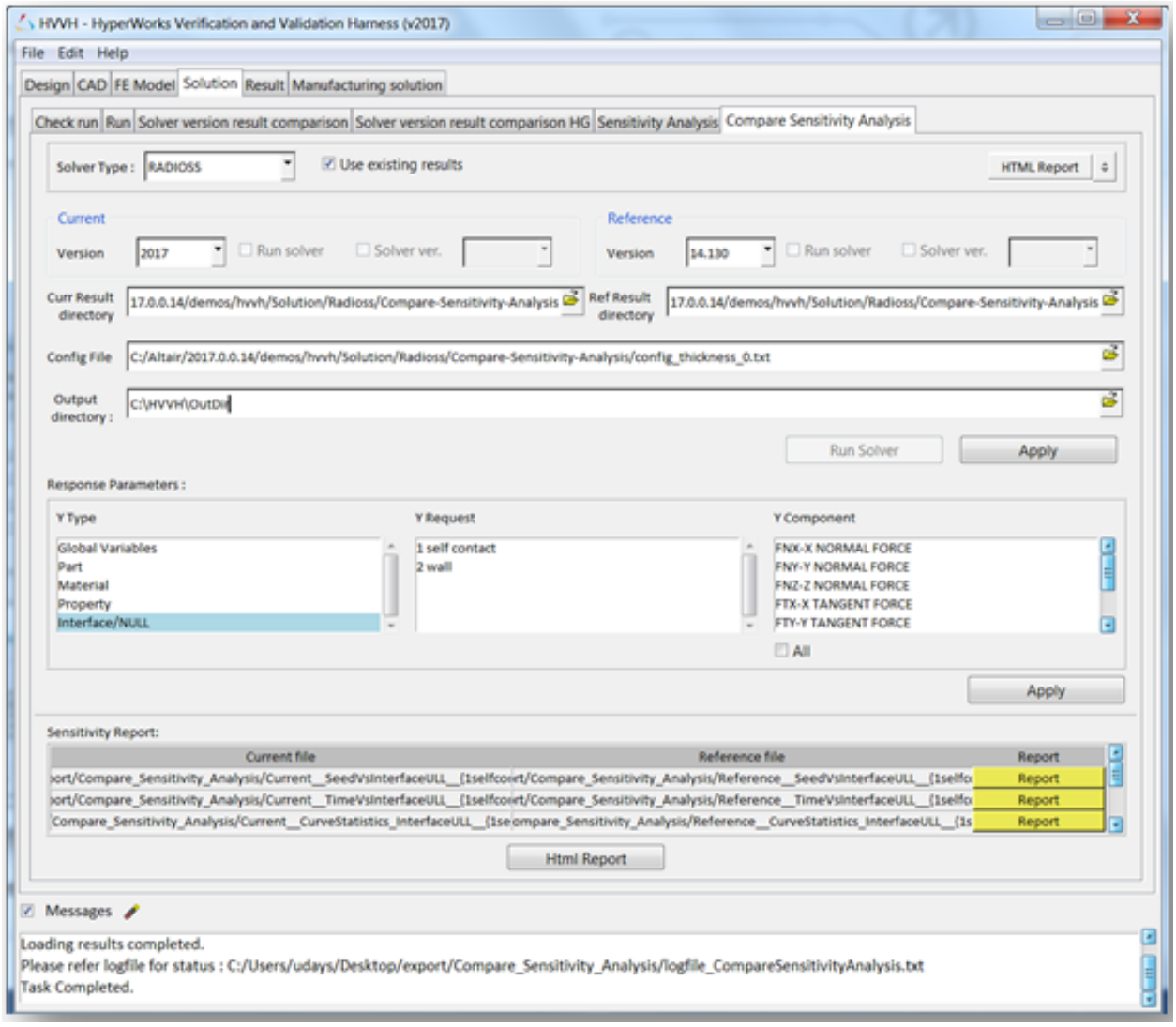
   `..tutorials\hvvh\Solution\Radioss\Compare-Sensitivity-Analysis\config_thickness_0.txt`

10. For the ***Output directory*** field, use the open file icon, , to select an output directory.
11. Click ***Apply***.

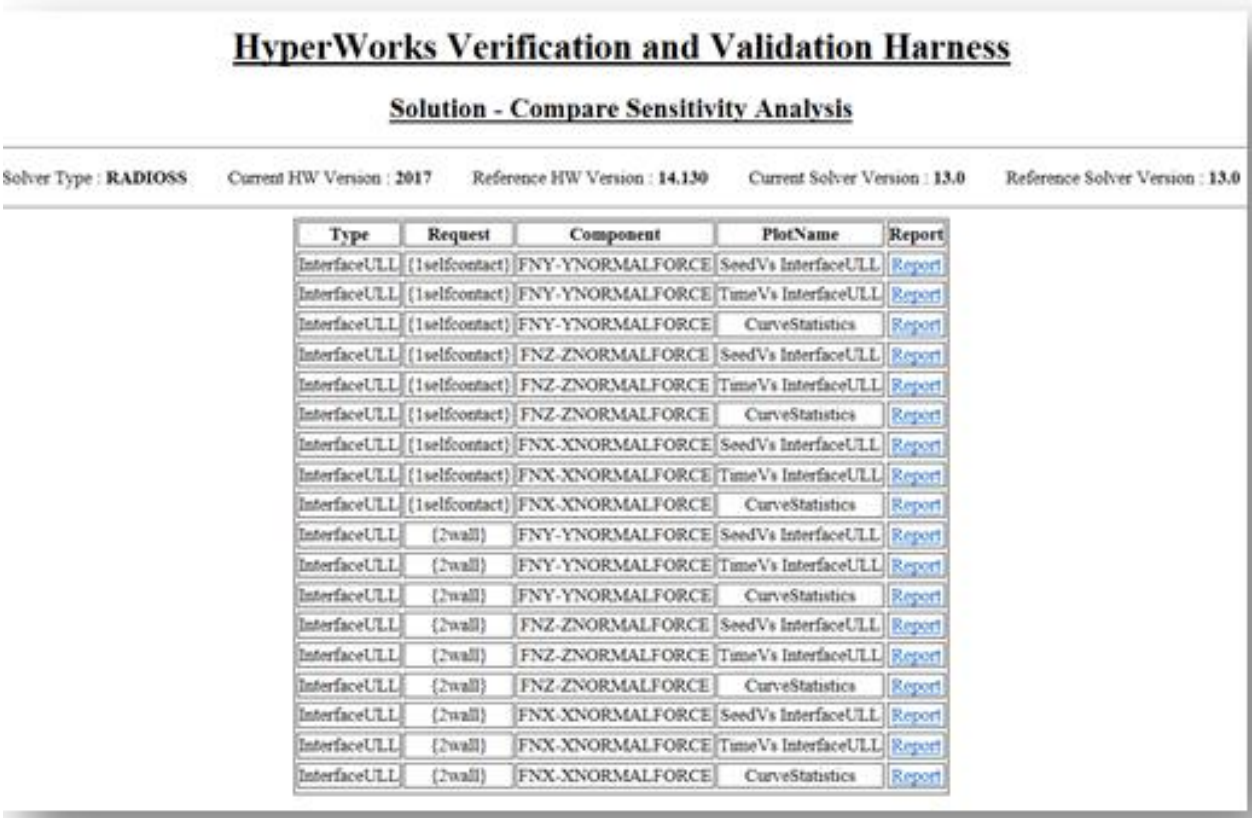
12. Select each ***All*** under the Type, Request, and Component (TRC) windows and click the second ***Apply*** button.

    The sensitivity report is generated for comparison across two versions.

13. In the **Messages** window, the run details are displayed along with the log file location.



14. Click ***HTML Report*** to open the sensitivity report.



HyperWorks Verification and Validation Harness

Solution - Compare Sensitivity Analysis

Solver Type : **RADIOSS** Current HW Version : **2017** Reference HW Version : **14.130** Current Solver Version : **13.0** Reference Solver Version : **13.0**

Type	Request	Component	PlotName	Report
InterfaceULL	{1selfcontact}	FNY-YNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNY-YNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNY-YNORMALFORCE	CurveStatistics	Report
InterfaceULL	{1selfcontact}	FNZ-ZNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNZ-ZNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNZ-ZNORMALFORCE	CurveStatistics	Report
InterfaceULL	{1selfcontact}	FNX-XNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNX-XNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{1selfcontact}	FNX-XNORMALFORCE	CurveStatistics	Report
InterfaceULL	{2wall}	FNY-YNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{2wall}	FNY-YNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{2wall}	FNY-YNORMALFORCE	CurveStatistics	Report
InterfaceULL	{2wall}	FNZ-ZNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{2wall}	FNZ-ZNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{2wall}	FNZ-ZNORMALFORCE	CurveStatistics	Report
InterfaceULL	{2wall}	FNX-XNORMALFORCE	SeedVs InterfaceULL	Report
InterfaceULL	{2wall}	FNX-XNORMALFORCE	TimeVs InterfaceULL	Report
InterfaceULL	{2wall}	FNX-XNORMALFORCE	CurveStatistics	Report

15. In the HTML report for one TRC, there will be two reports. For each of the solver results from different solver versions, the results are extracted and plotted for comparison.

    1. Seed Vs TRC.

    This is a scatter plot, showing sensitivity for each seed value. Using this sensitivity corridor, the variations across different seed vales for results from two solver versions can be determined.

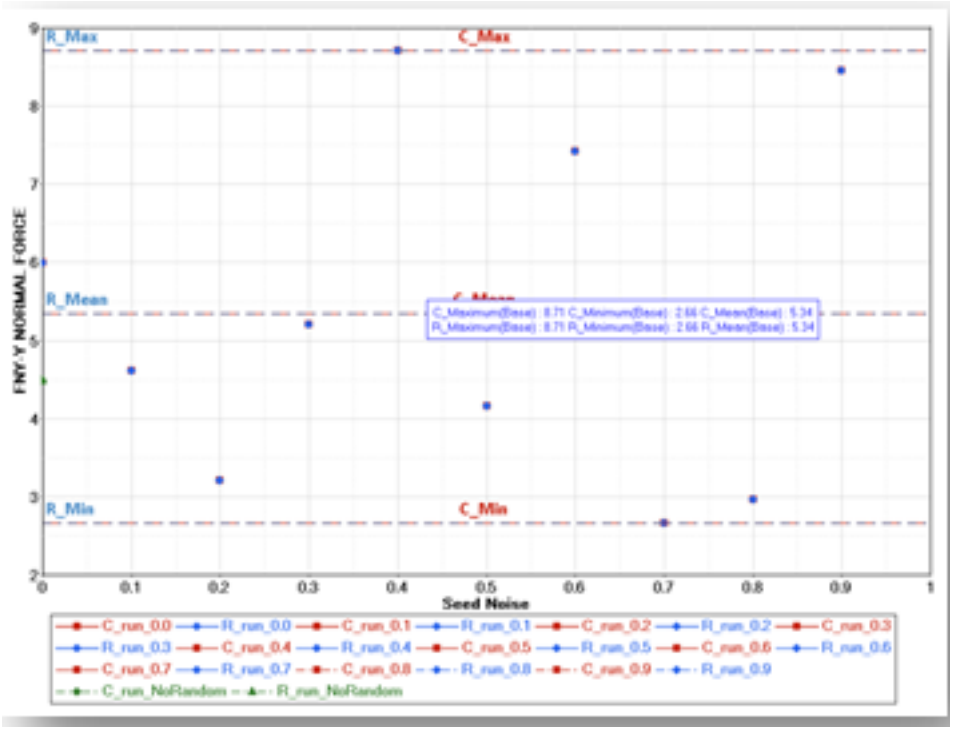
    2. Time Vs TRC.

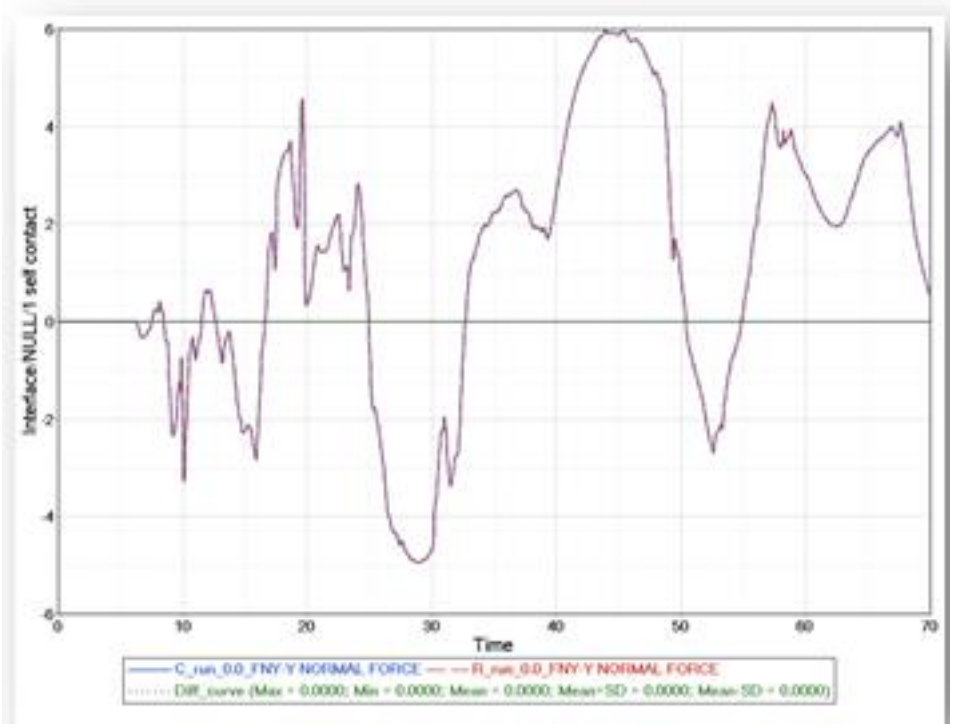
    This shows Time History (TH) plots for the current and reference files and their diff curve.

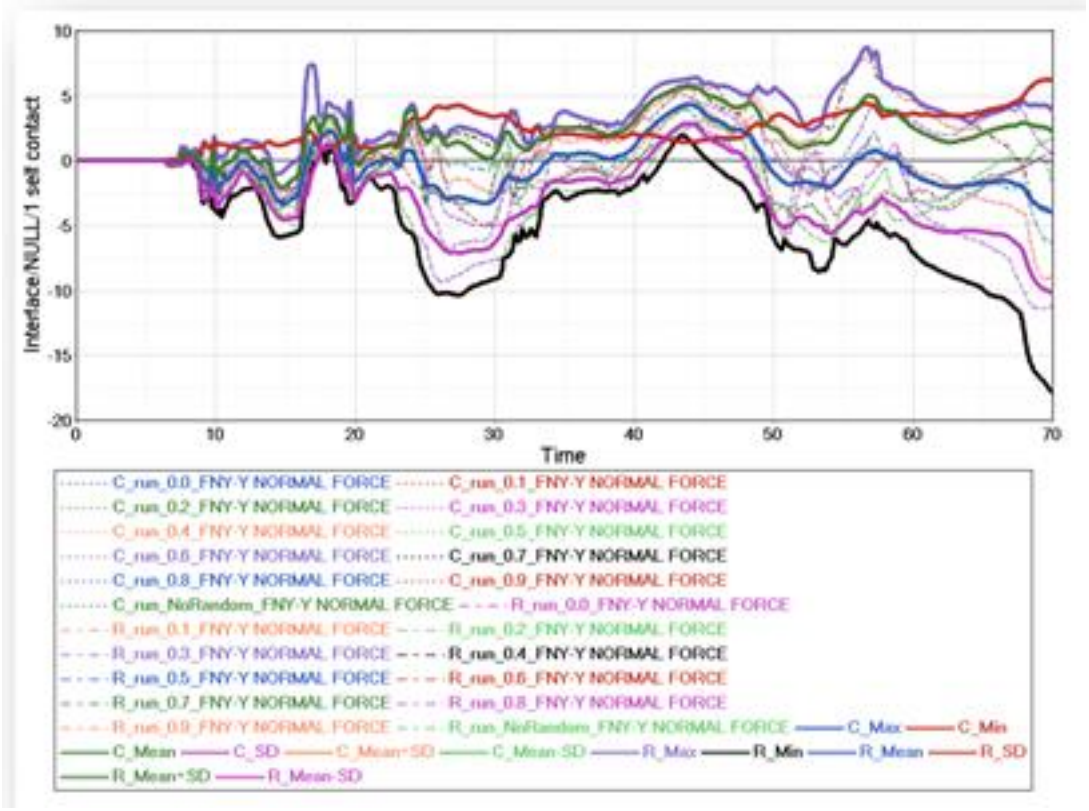
    3. Curve Statistic

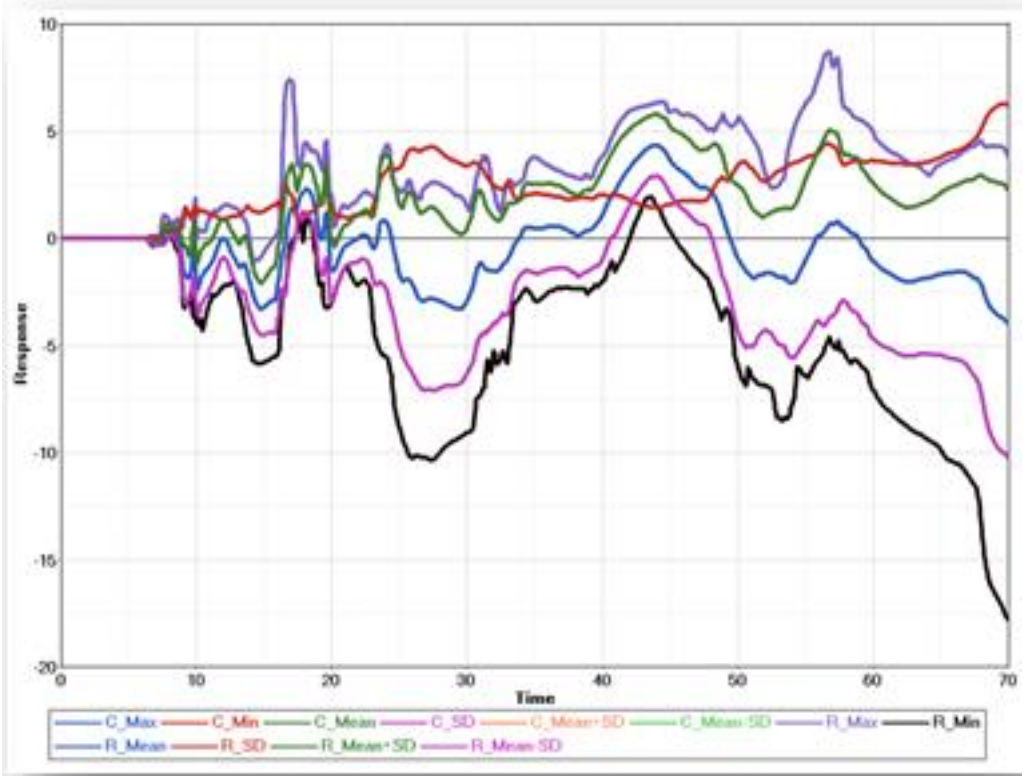
    - Envelop of all cures (Max, Min, Mean, SD, Mean+SD, and Mean-SD).

    - Statistical curves (Max, Min, Mean, SD, Mean+SD, and Mean-SD).


R_Max
C_Max
R_Mean
R_Min
C_Min
FNY:Y NORMAL FORCE
Seed Noise
C_run_0.0 R_run_0.0 C_run_0.1 R_run_0.1 C_run_0.2 R_run_0.2 C_run_0.3
R_run_0.3 C_run_0.4 R_run_0.4 C_run_0.5 R_run_0.5 C_run_0.6 R_run_0.6
C_run_0.7 R_run_0.7 C_run_0.8 R_run_0.8 C_run_0.9 R_run_0.9
C_run_NoRandom R_run_NoRandom


Interface:NULL/1 self contact
Time
C_run_0.0_FNY:Y NORMAL FORCE
R_run_0.0_FNY:Y NORMAL FORCE
Diff_curve (Max = 0.0000; Min = 0.0000; Mean = 0.0000; Mean+SD = 0.0000; Mean-SD = 0.0000)


Interface/NULL/1 self contact
Time
C_run_0.0_FNY-Y NORMAL FORCE
C_run_0.1_FNY-Y NORMAL FORCE
C_run_0.2_FNY-Y NORMAL FORCE
C_run_0.3_FNY-Y NORMAL FORCE
C_run_0.4_FNY-Y NORMAL FORCE
C_run_0.5_FNY-Y NORMAL FORCE
C_run_0.6_FNY-Y NORMAL FORCE
C_run_0.7_FNY-Y NORMAL FORCE
C_run_0.8_FNY-Y NORMAL FORCE
C_run_0.9_FNY-Y NORMAL FORCE
C_run_NoRandom_FNY-Y NORMAL FORCE
R_run_0.0_FNY-Y NORMAL FORCE
R_run_0.1_FNY-Y NORMAL FORCE
R_run_0.2_FNY-Y NORMAL FORCE
R_run_0.3_FNY-Y NORMAL FORCE
R_run_0.4_FNY-Y NORMAL FORCE
R_run_0.5_FNY-Y NORMAL FORCE
R_run_0.6_FNY-Y NORMAL FORCE
R_run_0.7_FNY-Y NORMAL FORCE
R_run_0.8_FNY-Y NORMAL FORCE
R_run_0.9_FNY-Y NORMAL FORCE
R_run_NoRandom_FNY-Y NORMAL FORCE
C_Max
C_Min
C_Mean
C_SD
C_Mean+SD
C_Mean-SD
R_Max
R_Min
R_Mean
R_SD
R_Mean+SD
R_Mean-SD


Response
Time
C_Max
C_Min
C_Mean
C_SD
C_Mean+SD
C_Mean-SD
R_Max
R_Min
R_Mean
R_SD
R_Mean+SD
R_Mean-SD