



Altair

HyperWorks

Altair HVVH Tutorials 2019

HVVH-3000: Design Tab

altairhyperworks.com

In this tutorial, you will learn how to:

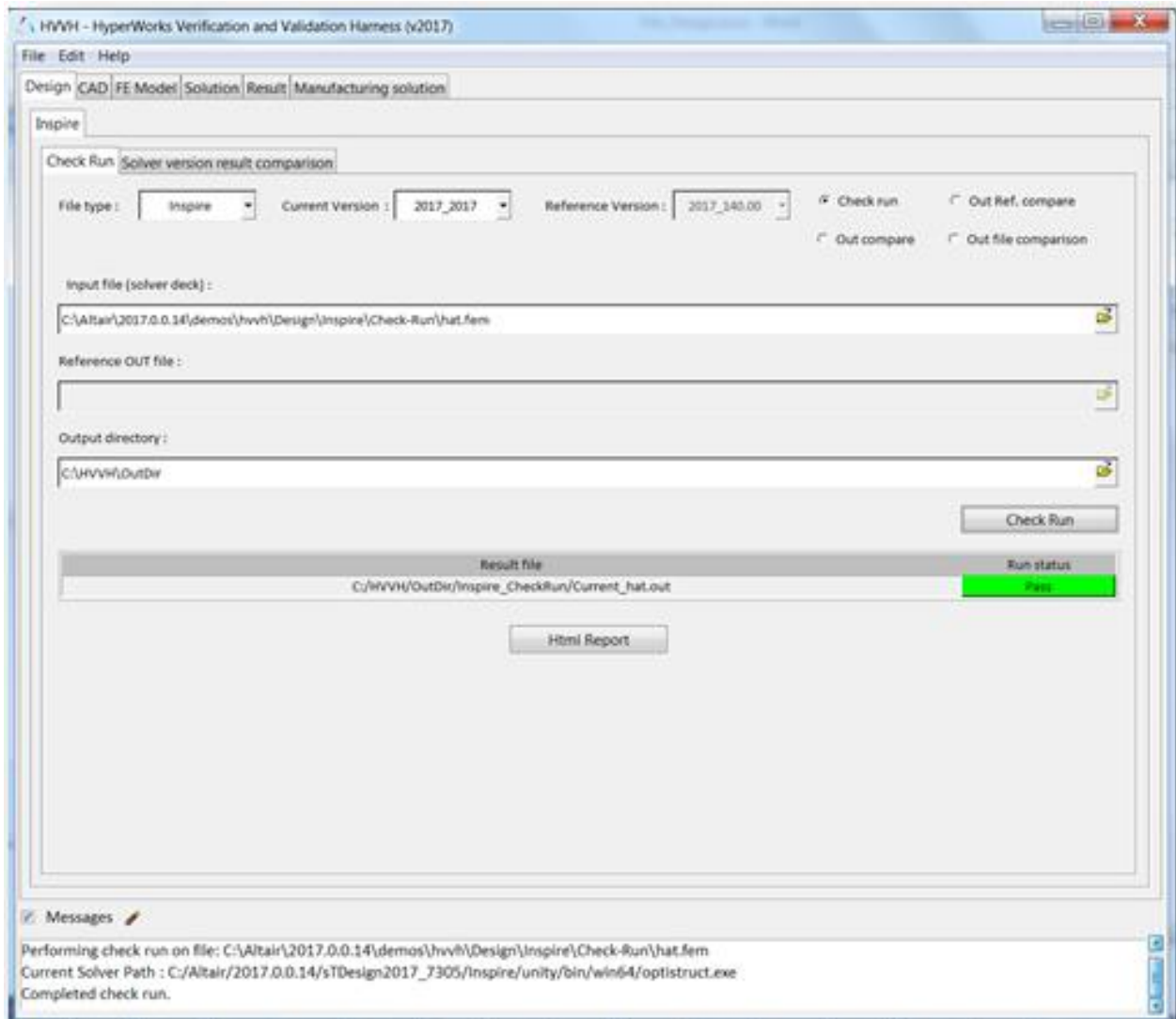
- Check run a solver deck generated with Altair Inspire
- OUT file comparison of Altair OptiStruct-written result file after the check run



These additional options are available for the check run of the solver

1. Two OUT files generated from an Altair Inspire (Altair OptiStruct solver) run can be compared.
2. A current solver run OUT file can be compared with a reference OUT file.
3. Two OUT files generated from same solver deck using two different Altair Inspire (Altair OptiStruct solver) versions can be compared.
4. Solver version result comparison for Altair OptiStruct results for a model generated in Inspire
 - If the result files are not available, the solver run can be done in the background; result generated are used in the result comparison.

Step 1: Check run a model built in Altair Inspire (Altair OptiStruct deck).

1. From the **Start** menu, select **All Programs > Altair HyperWorks 2017 > Tools > HyperWorks Verification and Validation Harness**.
2. Select the **Design** tab, followed by the **Check Run** tab.
3. Select the **Check run** button.



4. For **File type**, select **Inspire** (default).
5. For **Current version**, select 2017_2017 (referring to Altair Inspire and Altair HyperWorks versions).
6. Under the **Input file** field, click the open file icon, , to search for and load additional input files. Load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`.
7. For the **Output directory** field, use the open file icon, , to select an output directory.
8. Click **Check Run**.
9. In the **Messages** window, the run details are displayed along with the log file location.
10. Errors are indicated as **Fail** otherwise, they are shown to **Pass**.
11. Click **HTML Report** to generate a check run report.

HyperWorks Verification and Validation Harness

Inspire - Check Run Report

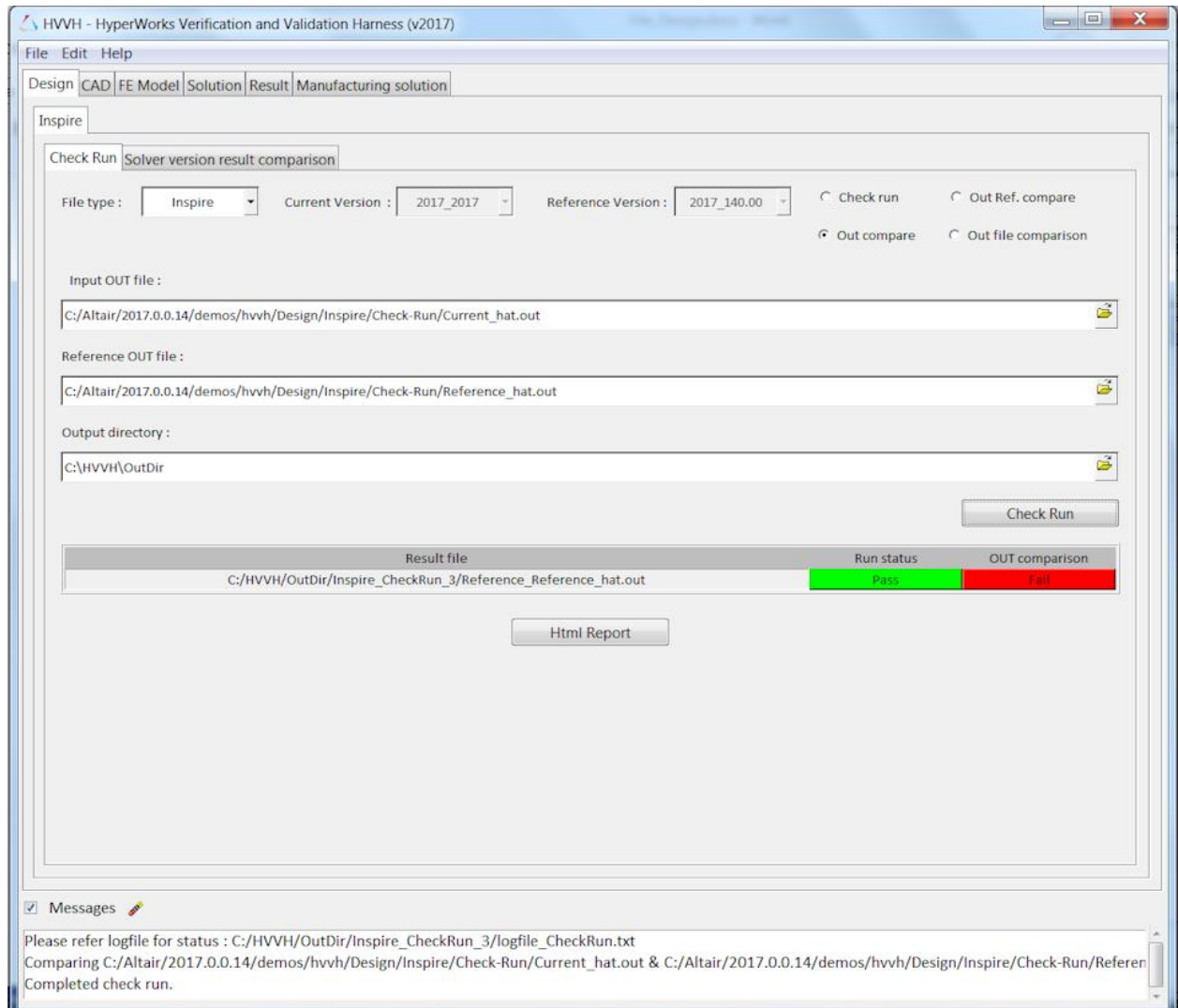
File Type : Inspire HW Version : 2017_2017




Result file	Run status
C:/HVVH/OutDir/Inspire_CheckRun/Current_hat.out	Pass


Step 2: Compare two OUT files (out files comparison).

Out files generated from an Altair OptiStruct solver check run can be directly compared.

1. From the **Design** tab > **Check Run** tab, select the **Out compare** button.



2. For **File type**, select **Inspire** (default).
3. Under the **Input file** field, click the open file icon, , to search for and load additional input files. Load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`.
4. Use the open file icon, , to open file browser and load the Input OUT file `Current_hat.out`, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`.
5. Use the open file icon, , to open the file browser and load the Altair OptiStruct Reference OUT file `Reference_hat.out`, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`.
This file is used to compare the first OUT file.

6. For the **Output directory** field, use the open file icon, , to select an output directory.
7. Click **Check Run**.
The two OUT files selected are compared. Some of the important blocks in the OUT files are compared. More blocks will be added in other versions.
8. After the Check run [OUT file comparison] the status of the comparison is displayed in the **Messages** window. In the Messages window, the run details are displayed along with the log file location.
9. Errors are indicated as **Fail** otherwise, they are shown to **Pass**.
10. Click **HTML Report**. Comparisons 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

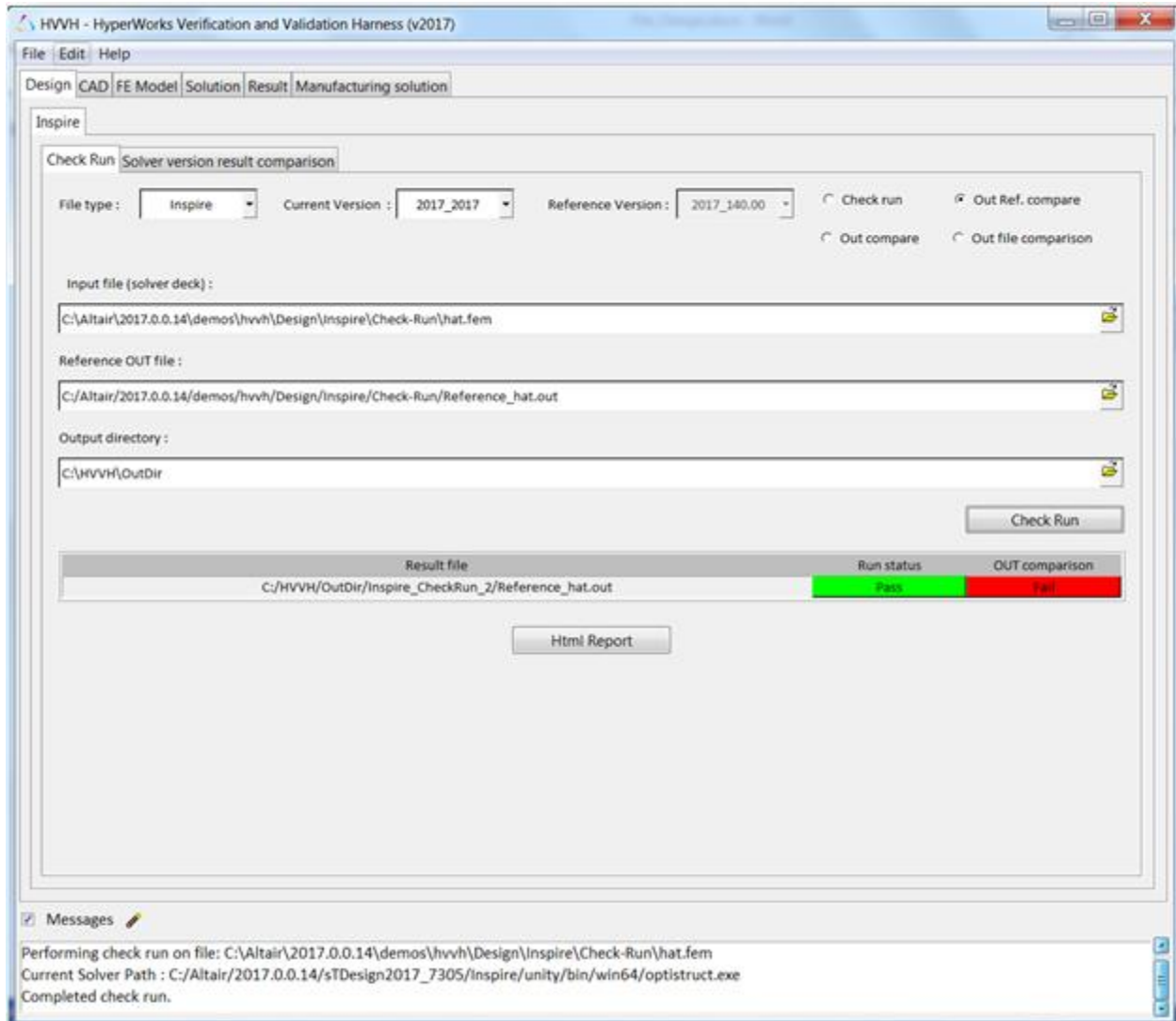
Inspire - Check Run Report




File Type : **Inspire**Current Version : **2017_2017**Reference Version : **2017_140.00**

Result file	Run status	OUT comparison
C:/HVVH/OutDir/Inspire_CheckRun_3/Reference_Reference_hat.out	Pass	Fail

Step 3: OUT file comparison with a reference file.

Out files generated from an Altair OptiStruct solver check run can be compared with a pre-certified or reference OUT file.



1. From the **Design** tab > **Check Run** tab, select the **Out Ref. compare** button.
2. For **File type**, select **Inspire** (default).
3. For **Current Version**, select 2017.
4. Under the **Input file** field, click the open file icon, , to load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`. This is used for Inspire to run in the background.
5. Use the open file icon, , to open file browser and load the Reference OUT file `Reference_hat.out`, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`. This is used to compare the first generation OUT file.
6. For the **Output directory** field, use the open file icon, , to select an output directory.
7. Click **Check Run**.

The two OUT files selected are compared. Some of the important blocks in the OUT files are compared. More blocks will be added in other versions.

8. After the Check run [OUT file comparison] the status of the comparison is displayed in the **Messages** window. In the Messages window, the run details are displayed along with the log file location.
9. Errors are indicated as **Fail** otherwise, they are shown to **Pass**
10. Click **HTML Report**. Comparisons 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

Inspire - Check Run Report

File Type : **Inspire**

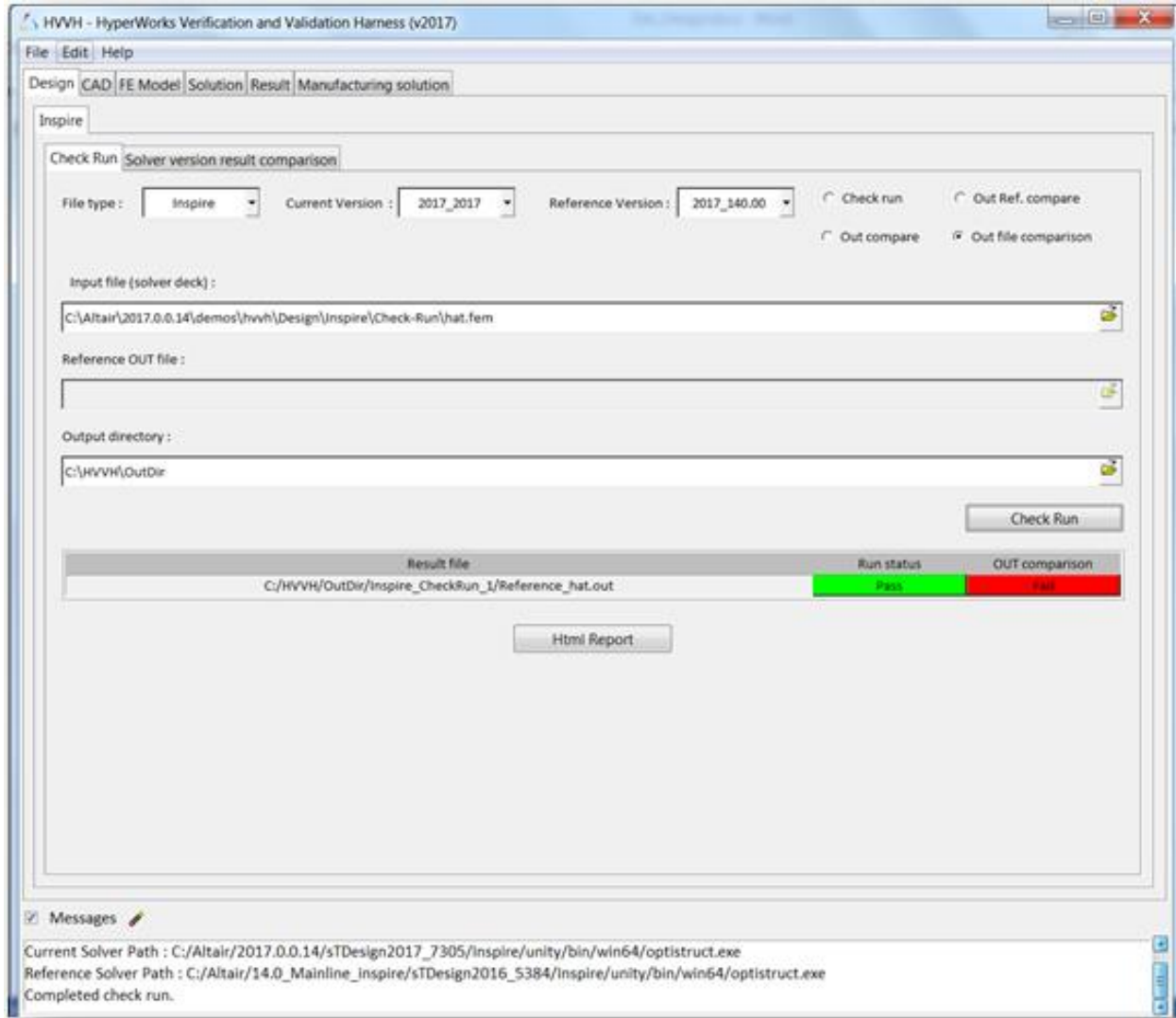
Current Version : 2017_2017

Reference Version : 2017_140.00

Result file	Run status	OUT comparison
C:/HVVH/OutDir/Inspire_CheckRun_2/Reference_hat.out	Pass	Fail

Step 4: Out file comparison from solver check runs.


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



1. From the **Design** tab > **Check Run** tab, select the **OUT file comparison** radio button.
2. For **File type**, select **Inspire** (default).
3. For **Current version**, select 2017_2017 (referring to the Altair Inspire and Altair HyperWorks versions).
4. For **Reference version**, select 2017_14.0.0.

4. Under **Input file**, click  and load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Check-Run`.

This is the solver file that will be used to run the solver for the Check run. An OUT file is created in the output directory.

5. For the **Output directory** field, click  to select an output directory.
6. Click **Check Run**.

From the same input file, the current version OUT file and reference version OUT file are generated and compared. Some of the important blocks in the OUT files are compared.

7. After the **Check run** (OUT file comparison), the status of the comparison is displayed in the **Messages** window. In the Messages window, the run details are displayed along with the log file location.
8. Errors are indicated as **Fail** otherwise, they are shown to **Pass**.
9. Click **HTML Report**. Comparisons 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

Inspire - Check Run Report

File Type : **Inspire**

Current Version : 2017_2017

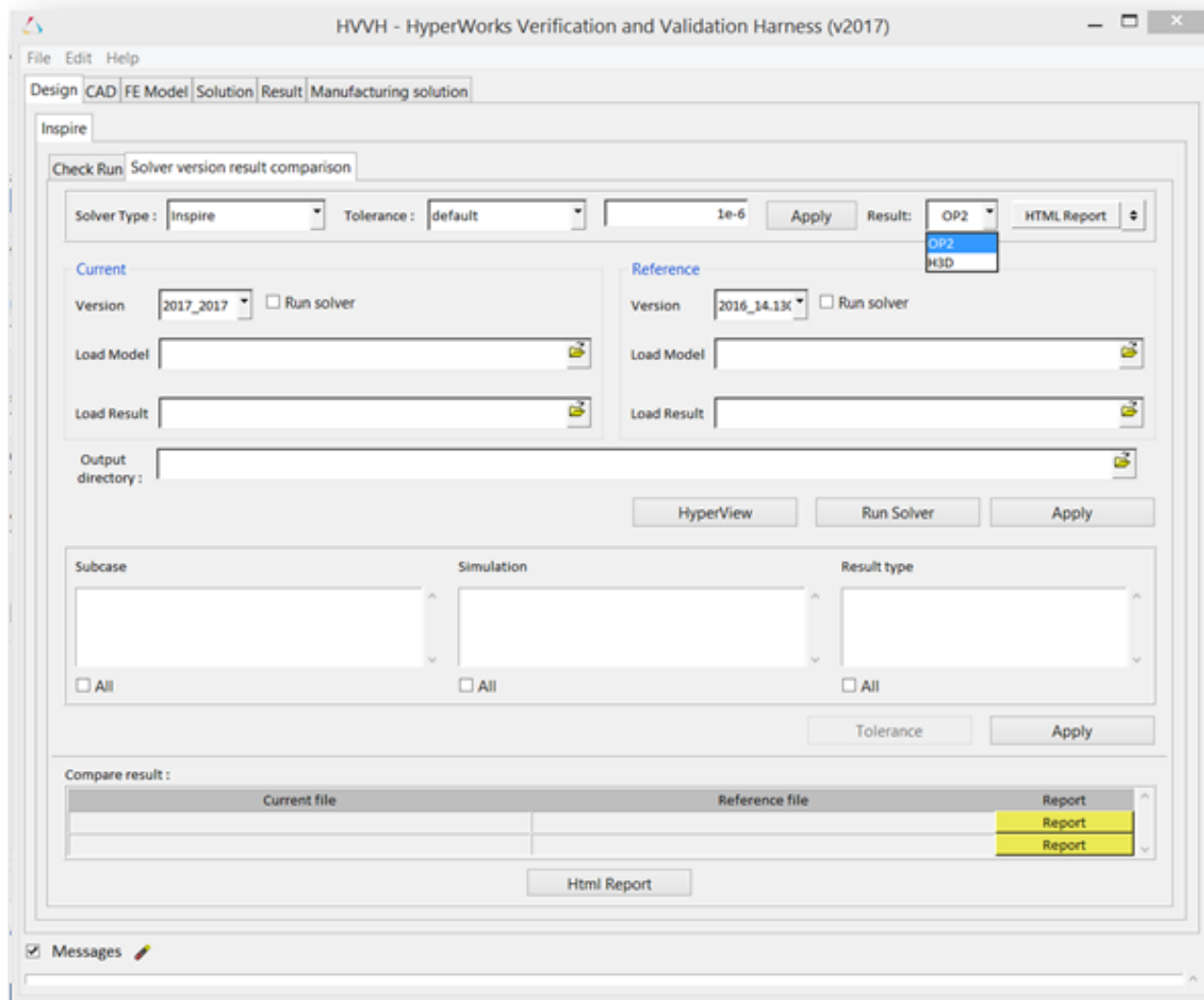
Reference Version : 2017_140.00




Result file	Run status	OUT comparison
C:/HVVH/OutDir/Inspire_CheckRun_1/Reference_hat.out	Pass	Fail

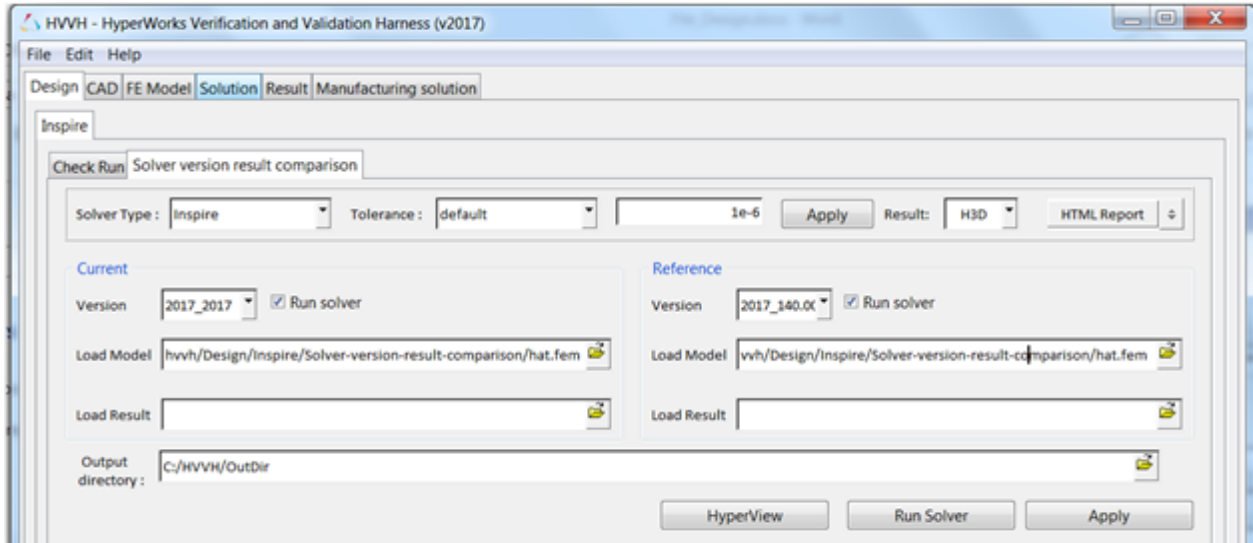
Step 5: Solver version result comparison.

This step illustrates solver version result comparison for Altair OptiStruct results for a model generated in Inspire. If the result files are not available, the solver run can be done in the background. The results generated are used in result comparison.

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

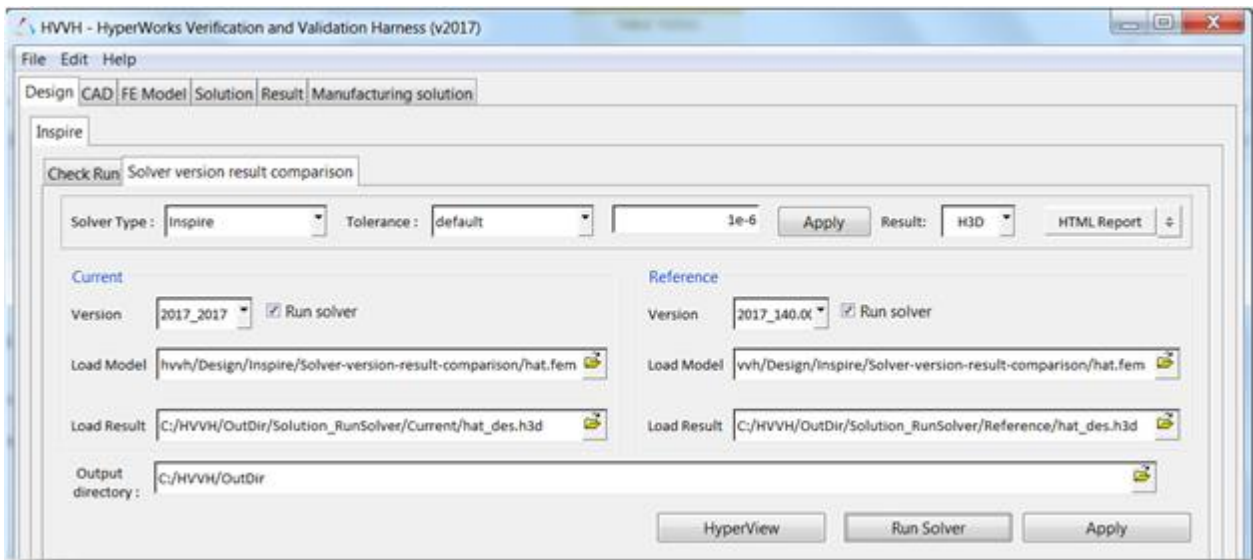


2. For the **Solver Type**, select **Inspire** (default).
3. For the **Tolerance**, select default and leave 1e-06 as the value. You can set any tolerance for the **Scalar**, **Vector** or **Tensor** data types.
4. For **Result**, select **H3D**.
5. Click **HTML report**.
6. Under **Current/Load Model**, click  and load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Solver-version-result-comparison`.
7. Under **Reference/Load Model**, click  and load the `hat.fem` file, located in `..\tutorials\hvvh\Design\Inspire\Solver-version-result-comparison`.
8. For the **Output directory** field, click  to select an output directory.



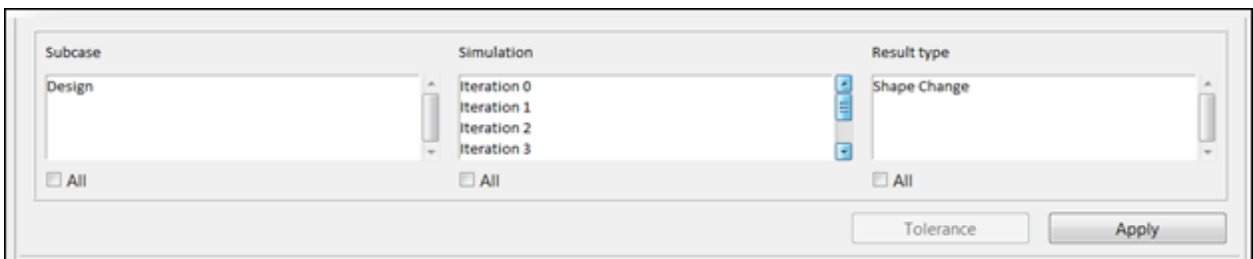
9. Activate the **Run solver** option.

10. Click the **Run Solver** button. This runs the solver in different versions of Altair Inspire and loads the results in the **Load Result** box.



11. Click **Apply**.

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



20. 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 are differences in case of failure.
21. Click the right window to maximize/minimize the plot. The difference values for each step are calculated and the min/max values of difference are plotted.
22. For following two options, please refer to the Solution tab > Solver version result comparison section:
 - Solver version result comparison (Altair HyperView option)
 - Solver version result comparison (Run solver option)