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HS-1515: Using HyperView Results Math Integration for Output Response Extraction

In this tutorial, you will learn how to:

- Setup a study
- Add a model
- Add output responses using Results Math

This tutorial runs a simple DOE study to showcase the process to use HyperView Results Math to extract output responses. This feature enables you to write an .xml file which queries the solver input and output files and then extracts the output responses in HyperStudy. This route queries the result faster and is considerable faster way to extract output responses of a group of elements or nodes than "readsim" function.

The files used in this tutorial can be found in <hst.zip>/HS-1515/. Copy the tutorial files from this directory to your working directory.



Step 1: Perform the Study Setup

This setup requires you to add a study and load the input file into HyperStudy. The input variables for the DOE study are selected as factors. A nominal run is performed (with OptiStruct as the solver), and the output responses for the DOE study are selected (in this case: Max stress of two different parts).

- 1. Start HyperStudy.
- 2. To start a new study, click **File** > **New** from the menu bar, or click \blacksquare on the toolbar.
- In the HyperStudy Add dialog, enter a study name, select a location for the study, and click OK.
- 4. Go to the **Define models** step.
- 5. Add a Parameterized File model.
 - a. From the **Directory**, drag-and-drop the Beam_Parts_4k.tpl file into the work area.



Note: The xml file needs to be copied to each run directory. A new batch file will copy the xml file to each directory, and then execute the OptiStruct job that needs to be registered.

Explorer	Direct	tory		4	ß	Define Mo	dels	
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Beam_Parts_4k.tpl		860 KB	tpl File	[+]			Ē	

- b. In the **Solver input file** column, enter Beam_Parts_4k.fem. This is the name of the solver input file HyperStudy writes during any evaluation.
- c. In the Solver execution script column, select OptiStruct (os).

 Active
 Label
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 1
 Image: Model 1
 m_1
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 Solver input file
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 Solver input arguments

- 6. Define a model dependency.
 - a. Click *Model Resources*.
 - b. In the **Model Resource** dialog, click **Add Resource** > **Add Input Resource**.
 - c. In the **Select File** dialog, navigate to your working directory and open the Beam_Parts_4k.xml file.
 - d. Set **Operation** to **Copy**.
 - e. Click Close.
- 7. Click *Import Variables*. Two input variables are imported from the Beam_Parts_4k.tpl file.
- 8. Go to the **Define Input Variables** step.
- 9. Review the input variable's lower and upper bound ranges.
- 10. Go to the **Specifications** step.

Step 2: Perform the Nominal Run

- 1. In the work area, set the **Mode** to **Nominal Run**.
- 2. Click Apply.
- 3. Go to the **Evaluate** step.
- 4. Click *Evaluate Tasks*. An approaches/nom_1/ directory is created inside the study directory.



5. Go to the **Define Output Responses** step.

Step 3: Create and Define Output Responses

In this step you will create two output responses: Part 22 and Part 24.

- 1. Create the Part 22 output response.
 - a. From the Directory, drag-and-drop the Beam_Parts_4k.xml file, located in approaches/nom 1/run 00001/m 1, into the work area.
 - b. In the **File Assistant** dialog, set the **Reading technology** to *Altair*® *HyperWorks*® and click *Next*.
 - c. Select **Single item in a time series**, then click **Next**.
 - d. Define the following options, and then click **Next**.
 - Set Subcase to SUBCASE 1 = 1.33 deltaP.
 - Set Type to Part Stress (Part).
 - Set **Request** to **Part 22**.
 - Set Component to VM Max.

🚽 File Assistan	t 💌			
Single serial or time series				
Subcase:	SUBCASE 1 = 1.33 deltaP			
Type:	Part Stress (Part)			
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- e. Label the output response Part 22.
- f. Set Expression to *First Element*.



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Create a Data Source and a Response						
Creating a new Data Source						
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>	Varname:	m_1_ds_1				
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	Label:	Part 22				
<u> </u>	Varname:	m_1_r_1				
	Comment:	Data Source 1				
	Expression:	m_1_ds_1[0] First Element ▼				
< Back Finish Cancel						

- g. Click *Finish*. The Part 22 output response is added to the work area.
- Create the Part 24 output response by repeating step 1. Change the **Request** to **Part** 24.

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Single serial or time series						
Subcase:	SUBCASE 1 = 1.33 deltaP					
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3. Click *Evaluate Expressions* to extract output response values.

	Active	Label	Varname	Expression	Value	Comment
1	1	Part 22	m_1_r_1	m_1_ds_1[0]	385.95584	Data Source 1
2	V	Part 24	m_1_r_2	m_1_ds_2[0]	181.50389	Data Source 2

4. Click **OK**. This complete the study setup.

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