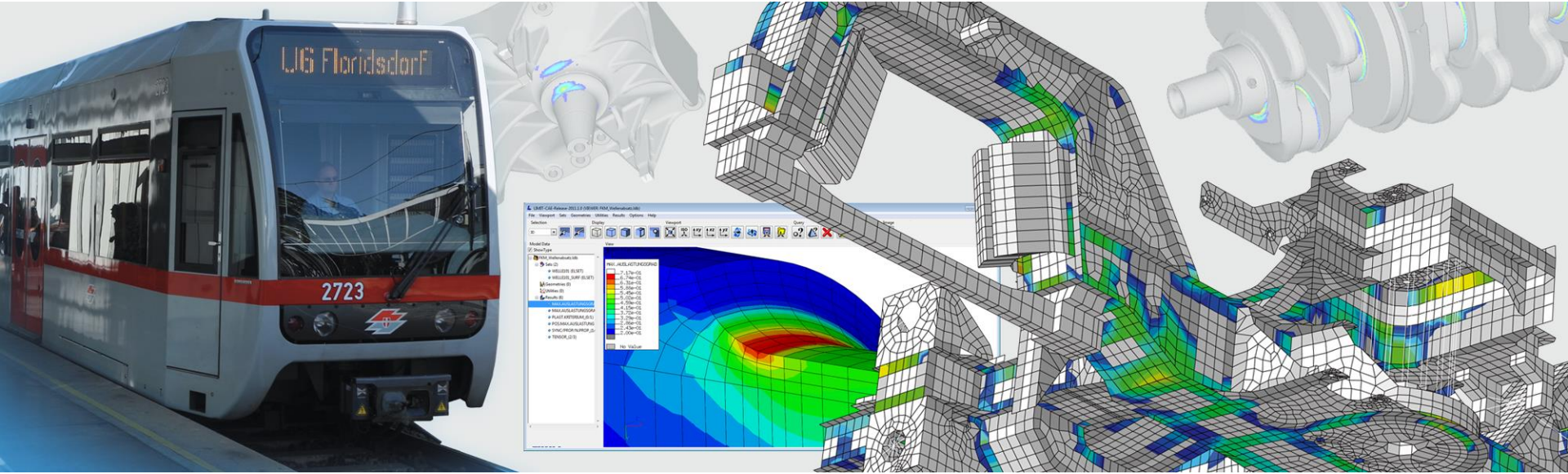
LIMIT
stress evaluation

Documentation



Interface LIMIT – SolidWorks

Supported SolidWorks Version in Release Package

- **SWX 2014 , SWX 2015**
- **SWX 2016 + Service Pack 05 or later!**
- **SWX 2017**
- **SWX 2018**
- **SWX 2019**

- **If you need a different version please contact LIMIT support (support@limit-fatigue.com)**

The following slides contain SWX-specific steps to do a LIMIT run using SWX FE results

Steps described in this document

- Overview of Workflow SWX & LIMIT
- Setting SolidWorks options
- Adding a shortcut symbol to the SolidWorks menue
- Using the Interface to export lswx and job files for LIMIT
- Importing the .job files into LIMIT-CAE
- Selecting geometry and results in the LIMIT JobManager

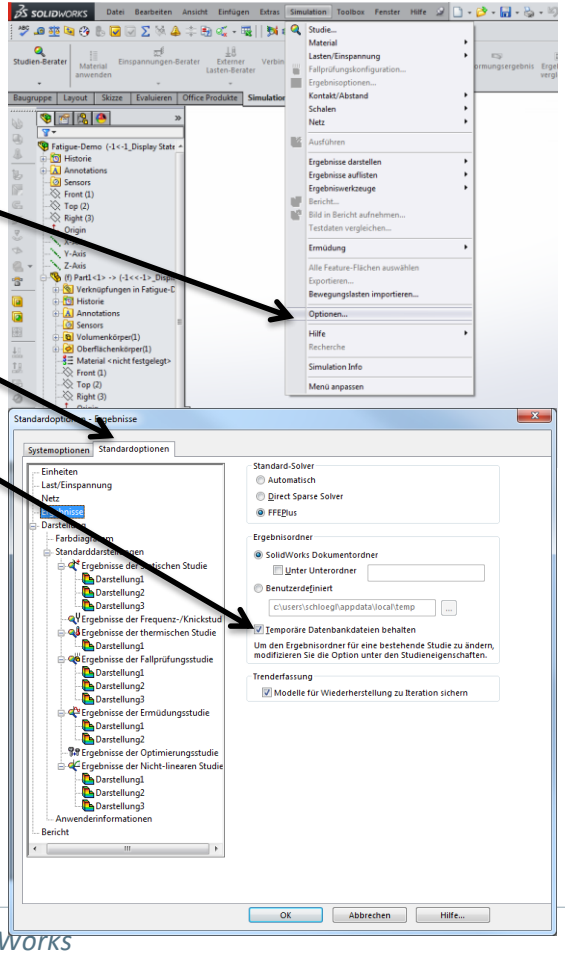
Workflow using SWX Simulation results with *LIMIT*

- Setup and run SWX-Simulation
- Run the SWX4LIMIT-Interface
- Export Finite Element result data for selected studies
- Start *LIMIT-CAE*
- Import the model and define assessment
- Run the assessment job
- Visualize the results in *LIMIT-Viewer*

Setting SolidWorks Options

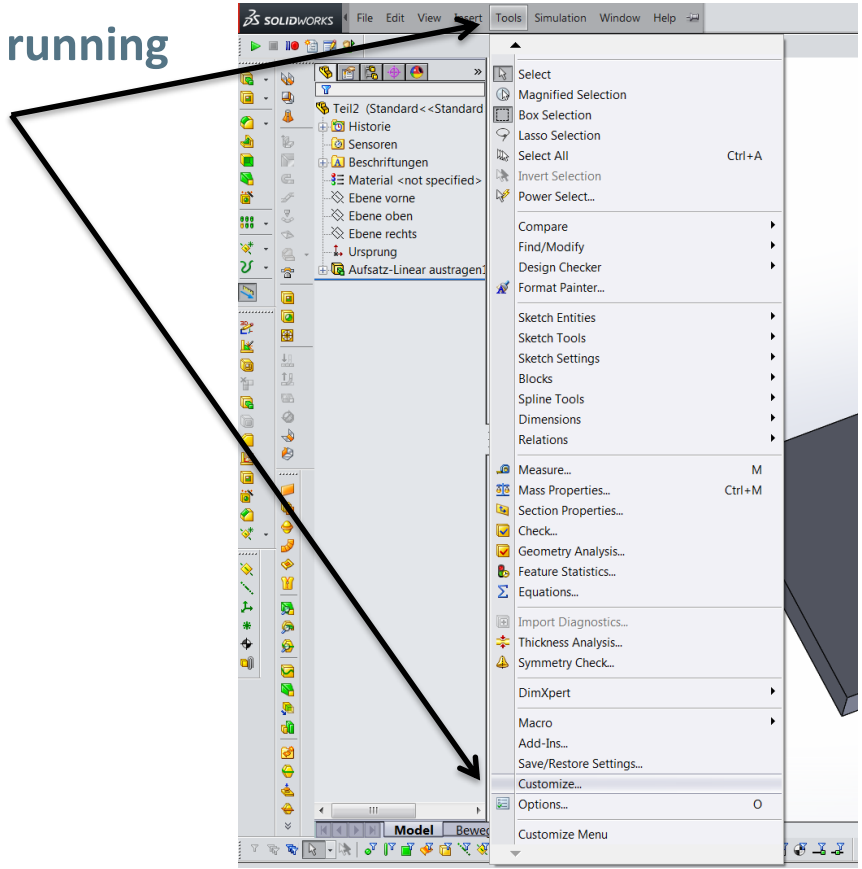
Default settings in SolidWorks:

- Click Simulation/Options in the simulation module
- Click Standard options/results and choose ‘keep temporary data base files‘
- To run a LIMIT-Job with SWX-Results these settings are necessary and **all the files** generated by SolidWorks after the SWX-FEM-run have to be placed in the LIMIT work directory.
  It is recommended to use the SWX work directory also as LIMIT work directory.



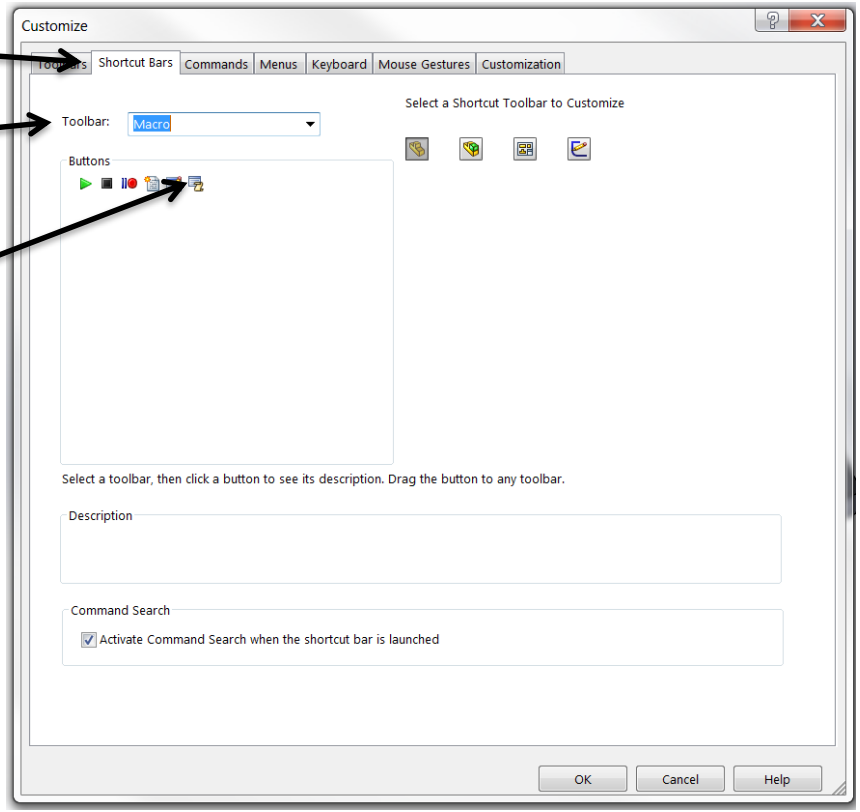
Adding a shortcut symbol for running the SWX4LIMIT-interface

- Click Tools – Customize



Adding a shortcut button

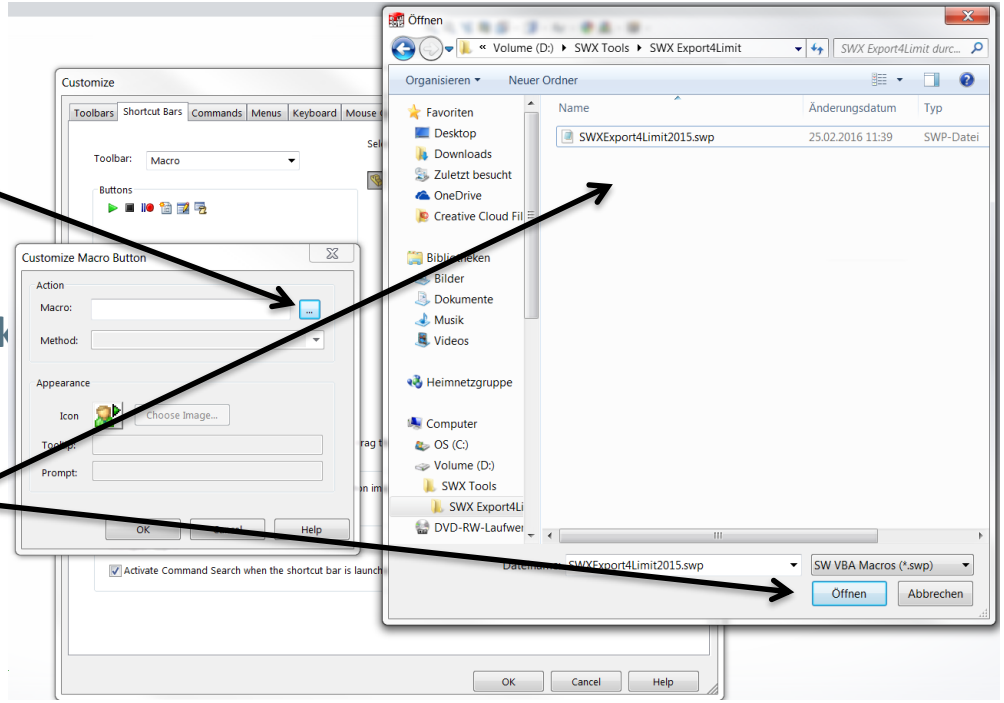
- Click ‚Shortcut Bars‘
- Select ‚Macro‘
- Drag the ‚New Macro Button‘ Symbol to the menu you want the button to be. Make sure to use a toolbar you use in part and assembly environment, otherwise you have to repeat this step while you create a new assembly.



Adding a shortcut button

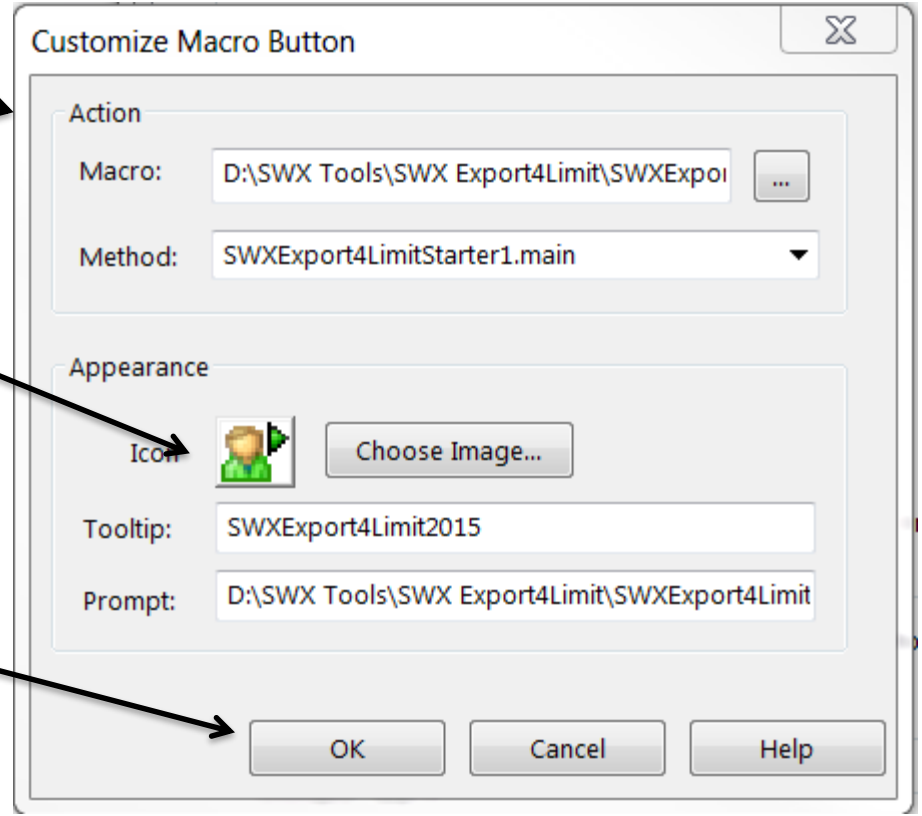
- **In the appearing window, Click onto the button with the three dots**

- **Select the file location of your ‚SWXExport4Limit201x.swp‘ and click**
  - Location of the files: *…\LIMIT-CAE-Release-201x\solidworks\SWX_201x*



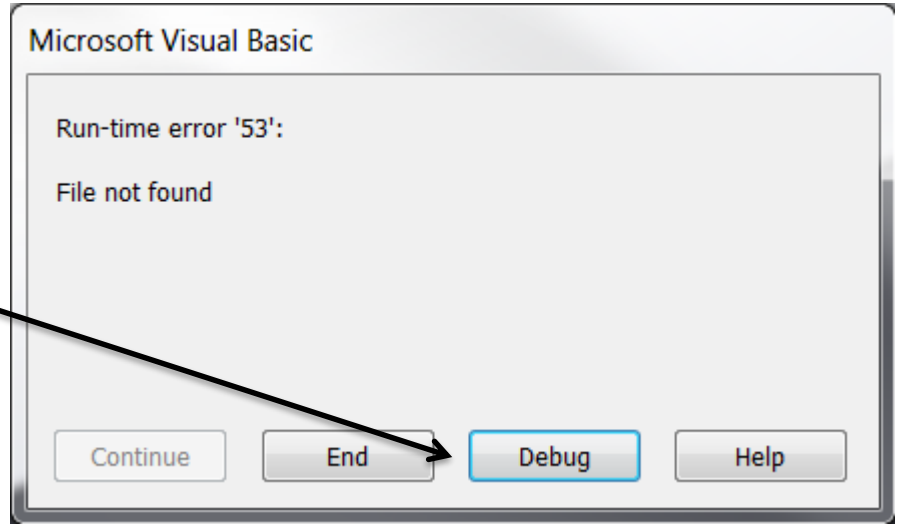
Adding a shortcut button

- **The window should now look similar to this**
- **You may choose another icon if wanted**
- **Click OK**
- **Close the ‚Customize' Window**



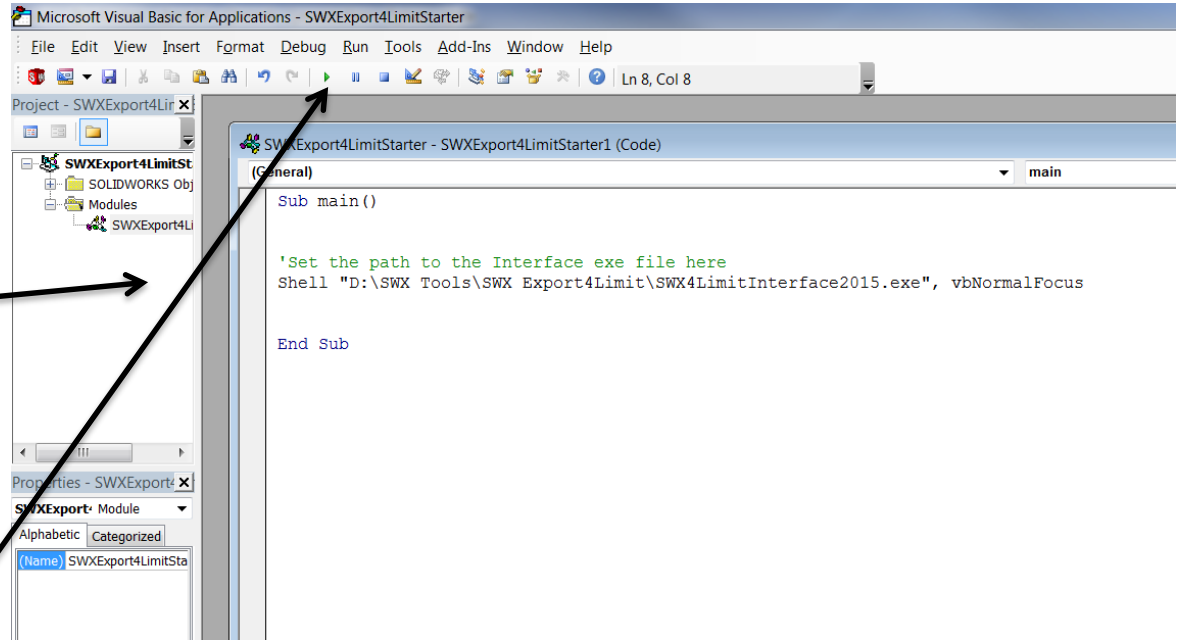
Adding a shortcut button

- Click onto the button you just created
- An error message will appear
- Click ‚Debug‘



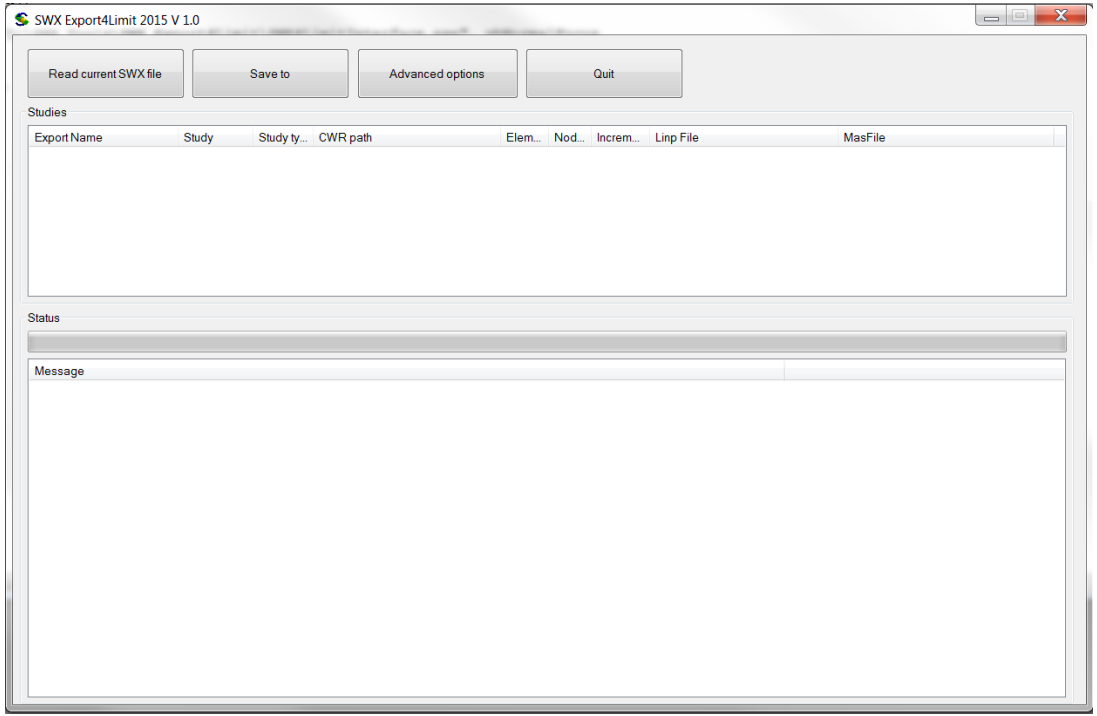
Adding a shortcut button

- The ‚Microsoft Visual Basic for Applications‘ window will appear
- Type/paste the path to your Interface exe file here
- Click ‚Save‘
- Click ‚Continue‘



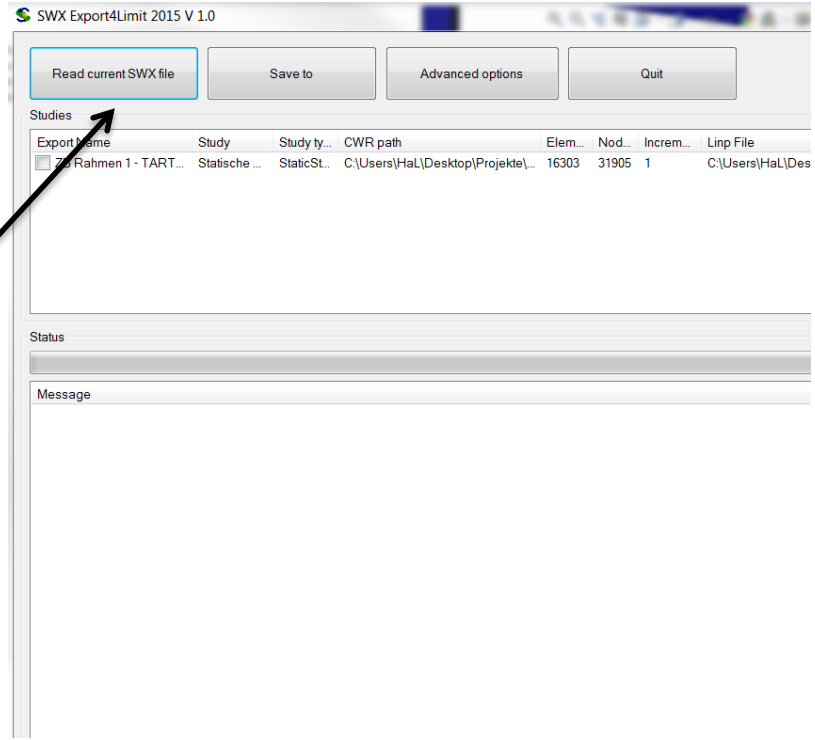
Adding a shortcut button

- **The ‚SWX Export4Limit201x‘ window appears and the shortcut menu setup is finished.**



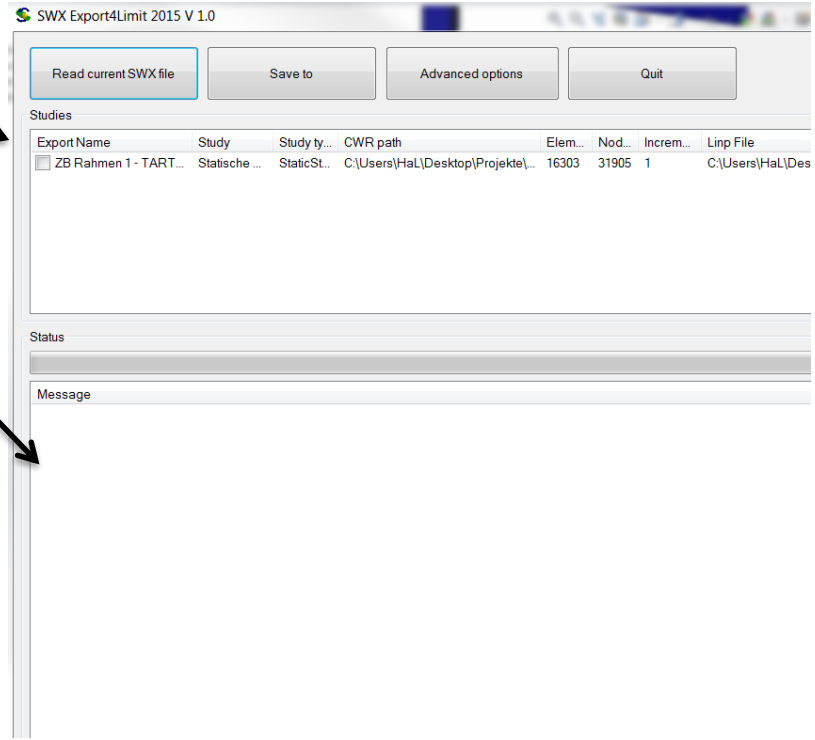
Using the Interface to export lswx and job files

- Open any assembly or part document containing your studies
- Make sure your SolidWorks Simulation package is running (If not, use Tools → Add-ins to run it)
- Run the Interface with the created shortcut button
- Click ‚Read current SWX file‘



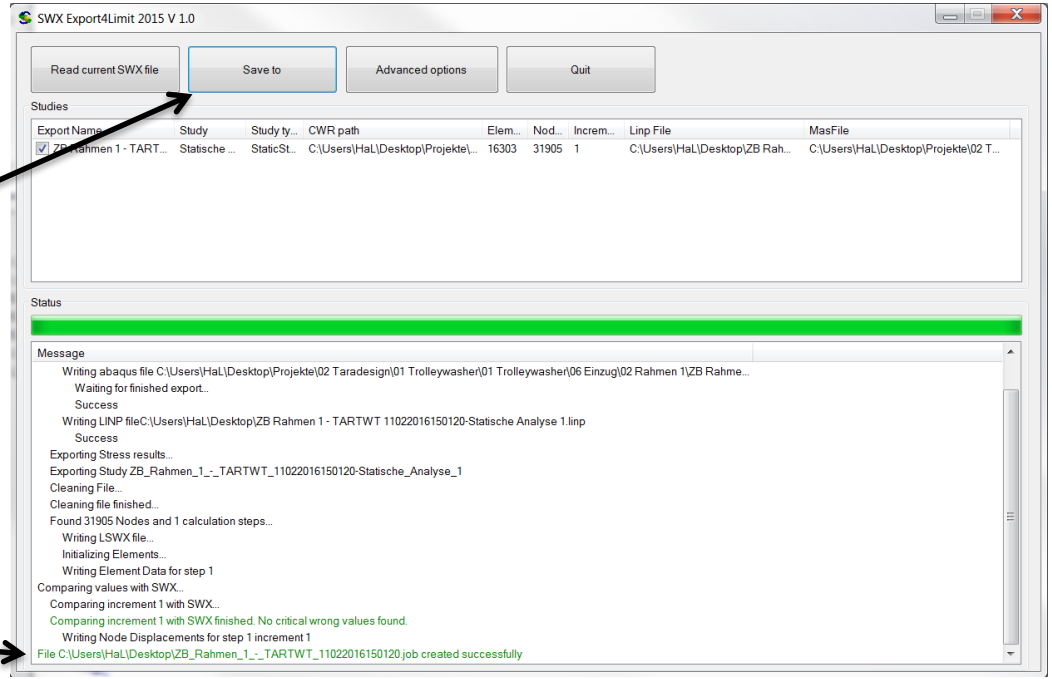
Using the Interface to export lswx and job files

- **The GUI will show all available studies in the opened document**
- **Any important status messages will be written into the ‚Message‘ window**



Using the Interface to export lswx and job files

- Select the studies you want to export
- Click ‚Save to‘
- Choose file path
- This message shows that process the is finished
- Close this window or Click ‚Quit‘

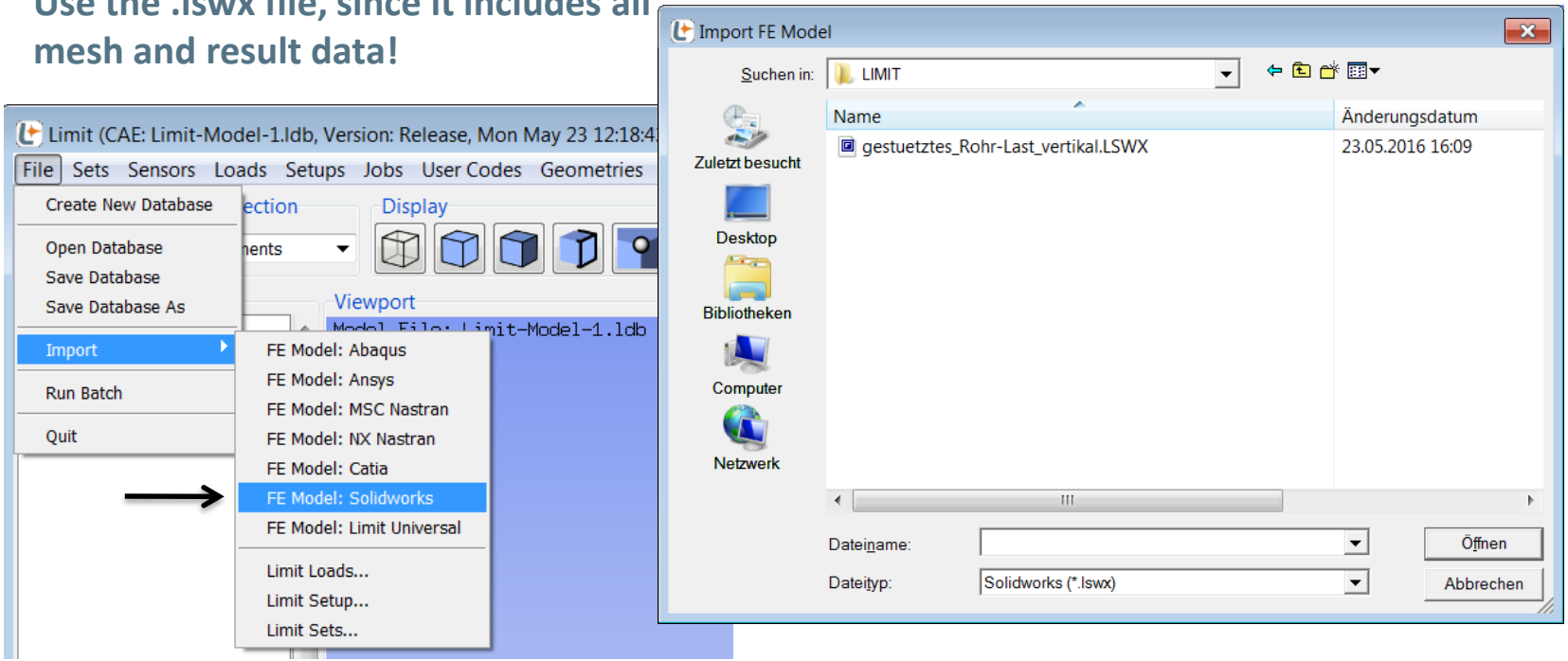


General Hints

- **You can run the Interface without the SolidWorks shortcut button, e.g. via Windows explorer**
- **The Interface will not work if ‚run as administrator' is set**
- **If you have more versions of SolidWorks installed, please contact LIMIT support**

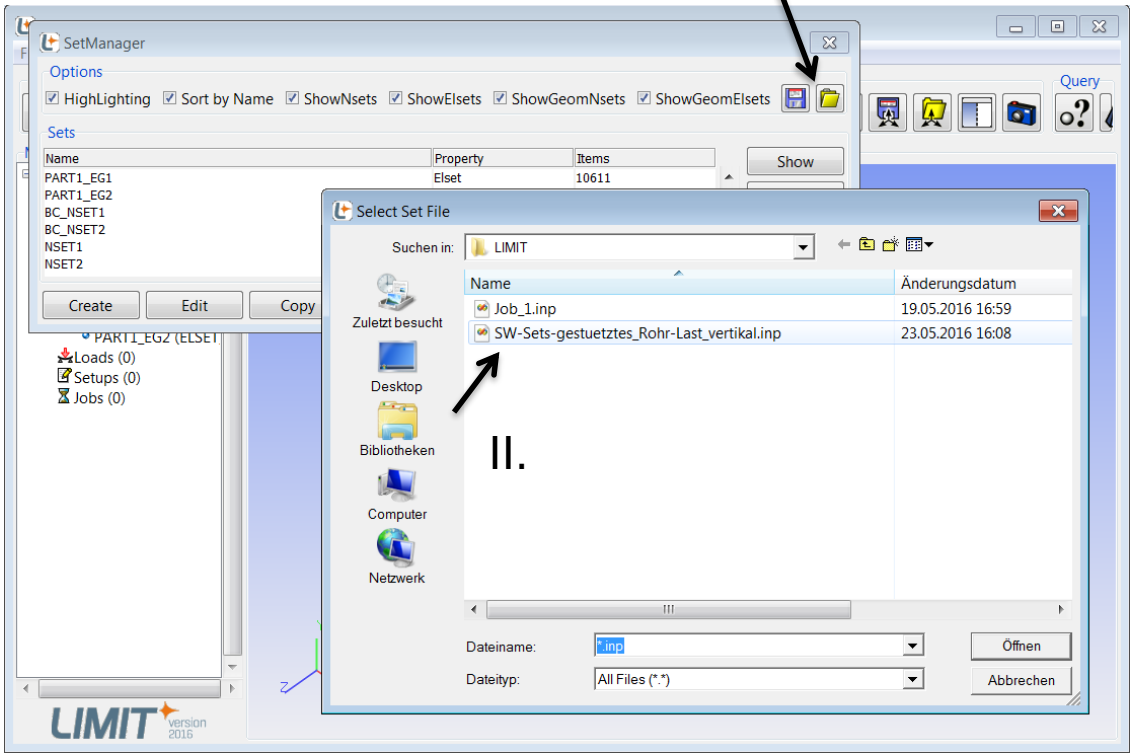
Importing the .lswx -file into LIMIT-CAE:

- Click File / Import / FE Model: Solidworks
- Use the .lswx file, since it includes all mesh and result data!



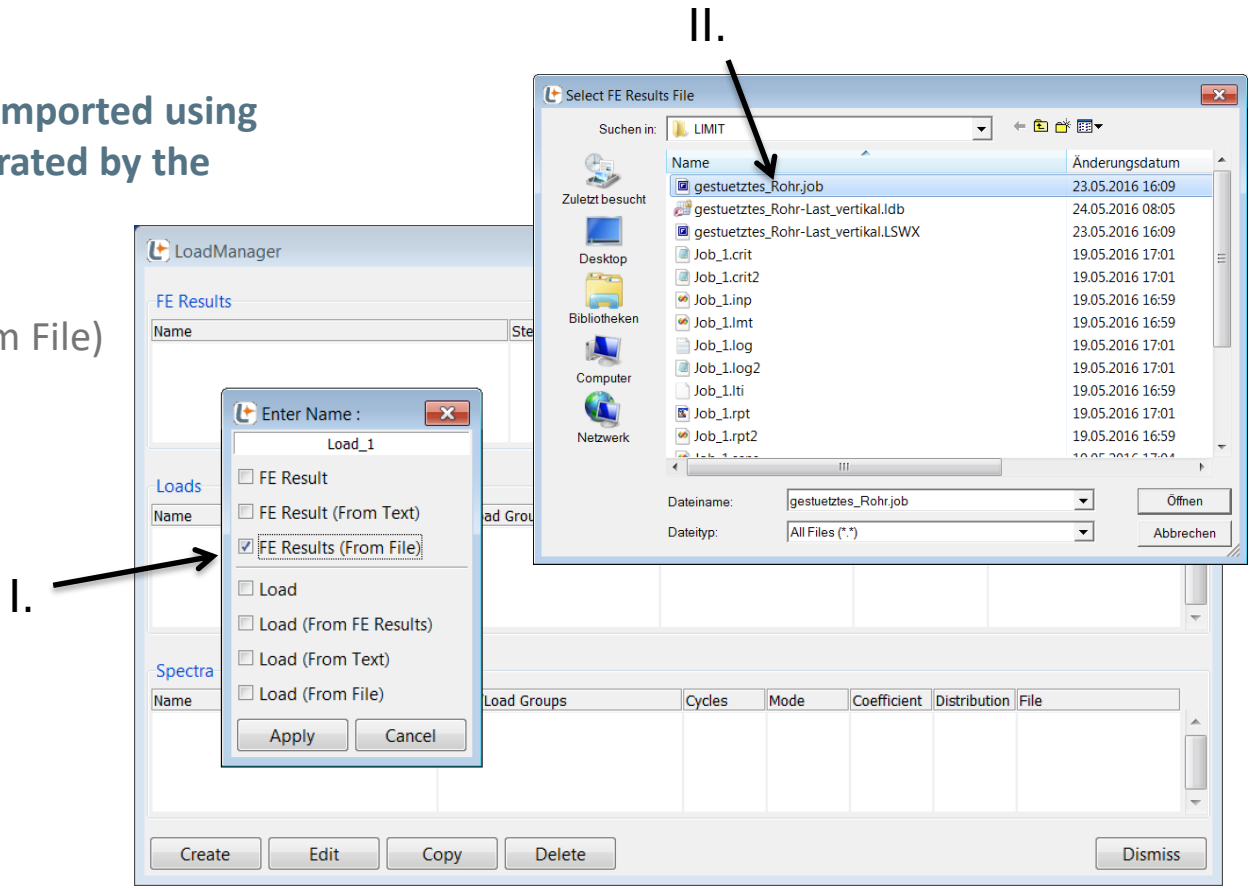
Importing the SWX part information:

- **Click: Sets / Open Set Manager / ….**
- **I. Click on folder icon**
- **II. Select: SW-Sets-[….].inp**
- **File includes:**
  - Part information
  - SW_Sets for quick generation of sensors



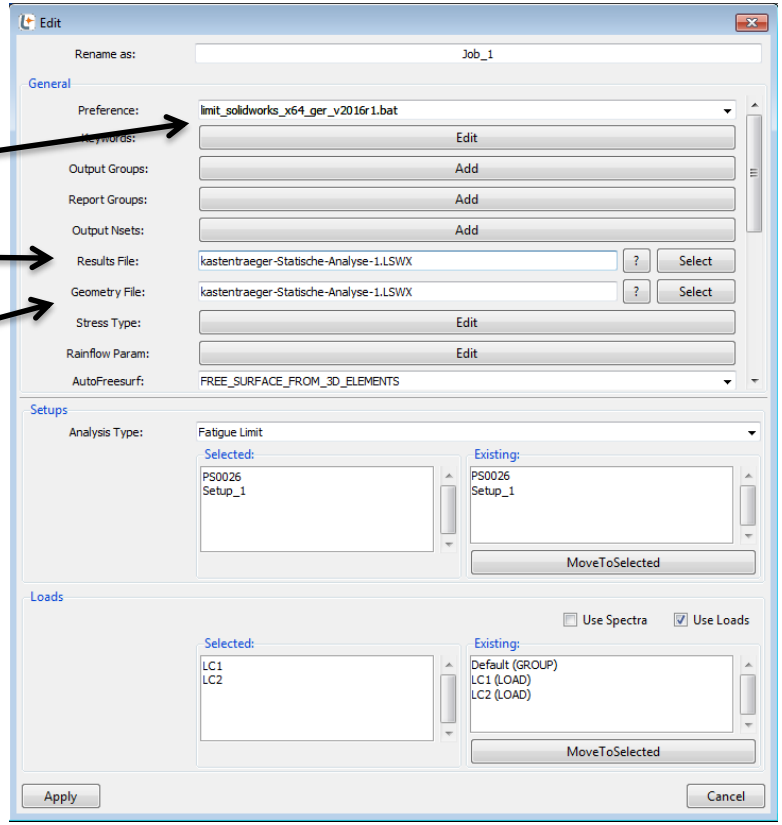
Load definition:

- **FE Results can be imported using the .job-files generated by the interface.**
- **Usage:**
  - I. FE Results (From File)
  - II. Select .job-file



Running a LIMIT job based on a SolidWorks simulation:

- **Create a new Job**
- **Select the preference SolidWorks**
- **Result File:**
  - Select the result file (.lswx), if none were defined in the LoadManager
- **Geometry File:**
  - Always select a .lswx-file to define the reference geometry for the analysis



Solid assessment:

- **Goal of a LIMIT FKM proof of strength:**
  - Assessment of surface stresses (2D-tensors)
  - Popular method and conservative
- **Free surfaces:**
  - Are necessary for the consideration of stress gradients normal to the surface
  - Are identified by the software LIMIT
  - Can be generated by covering the solids with 2D-elements (skin) in the preprocessor.
- **Supporting effect is only possible with solids!**
  - Results of a 3D analysis with good element quality and fine meshing are more precise than results of 2D-skin elements.

Following elements can be analyzed:

- **Solids :**
  - Higher order 3D-Solids (10 nodes tetrahedrons)
- **Shells:**
  - Higher order shells (6 nodes triangles)

Specification of the interface

- **Maximum nodenumber respectively elementnumber :**
  - Windows 64 bit (x64): 50000000
- **Maximum number of nodes :**
  - Windows 64 bit (x64): 6000000
- **Maximum number of elements :**
  - Windows 64 bit (x64): 6000000
- **These LIMITS can be changed by the user. See document LIMIT_2019, section: *Redimensioning of Arrays***

Last Slide