

Dantec Dynamics

Validation Tool 1.4.1

for Ansys WB Versions 19.2 to 2021 R2

Introductory Slides

by

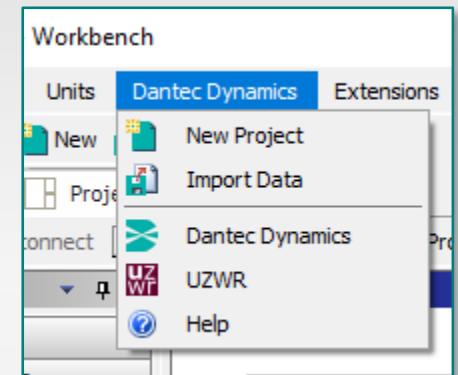
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University of Ulm
www.uzwr.de

Ulm Feb. 2022



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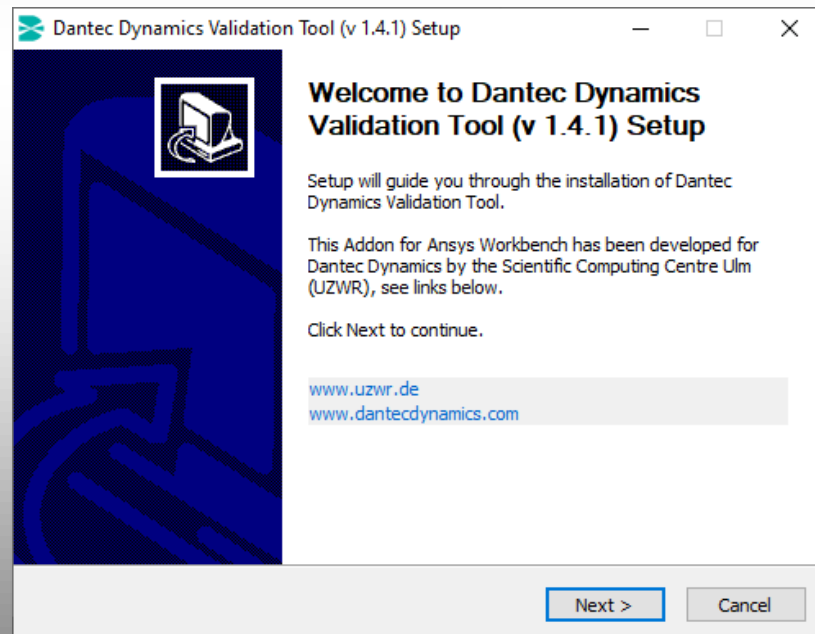


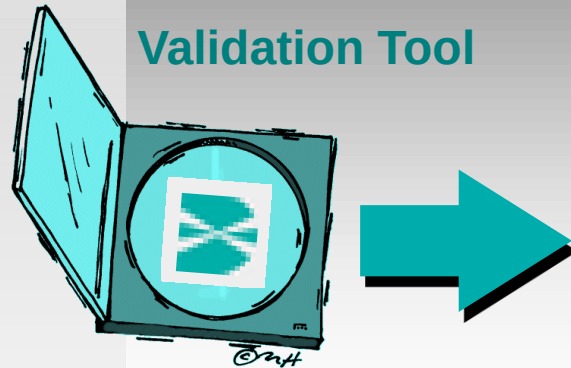
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Installer, straight forward

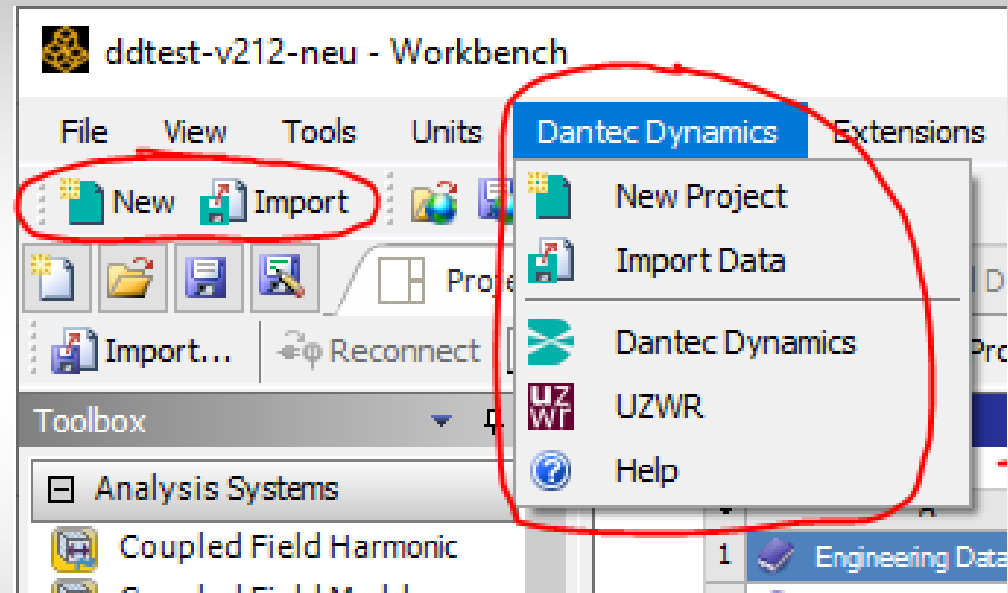
- Version 1.4.1 for Ansys WB Versions 19.2 to 2021 R2 only
- Tool will only be installed for ONE, the latest Ansys Version on a system.
- Copies the needed files into the necessary Ansys directories.
- Source: www.uzwr.de > Information > Downloads > Validation Tool





Ansys WB Add On

- WB 19.2 to 2021 R2
- Windows 10

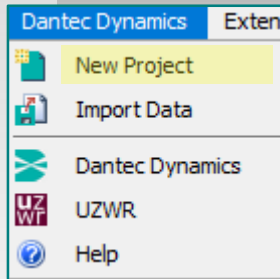


After successful installation you should see ...

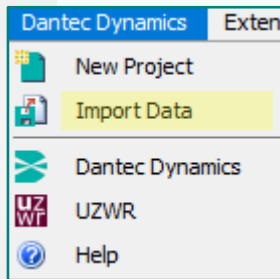
- a toolbar extension with two buttons [New] and [Import]
- a new main pop down menu item “Dantec Dynamics”

Pop Down Menu “Dantec Dynamics”

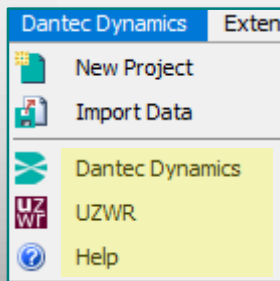
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- **New Project** creates a Template (complete & running, easy to modify).
Hit this button and define a new name and location of your project.



- **Import Data:** reading and converting Dantec Dynamics data (hdf5) into Ansys



- **Dantec Dynamics** and
- **UZWR** links to corresponding homepages
- Online **Help** system

Start a New Project

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- Based on a Template Project**
- Click on [New] and
 - Define new name and working space for the new project.

The screenshot displays the ANSYS Workbench interface with a project named 'ddtest-v212-neu - Workbench'. The 'Project Schematic' area shows a hierarchical structure of analysis systems:

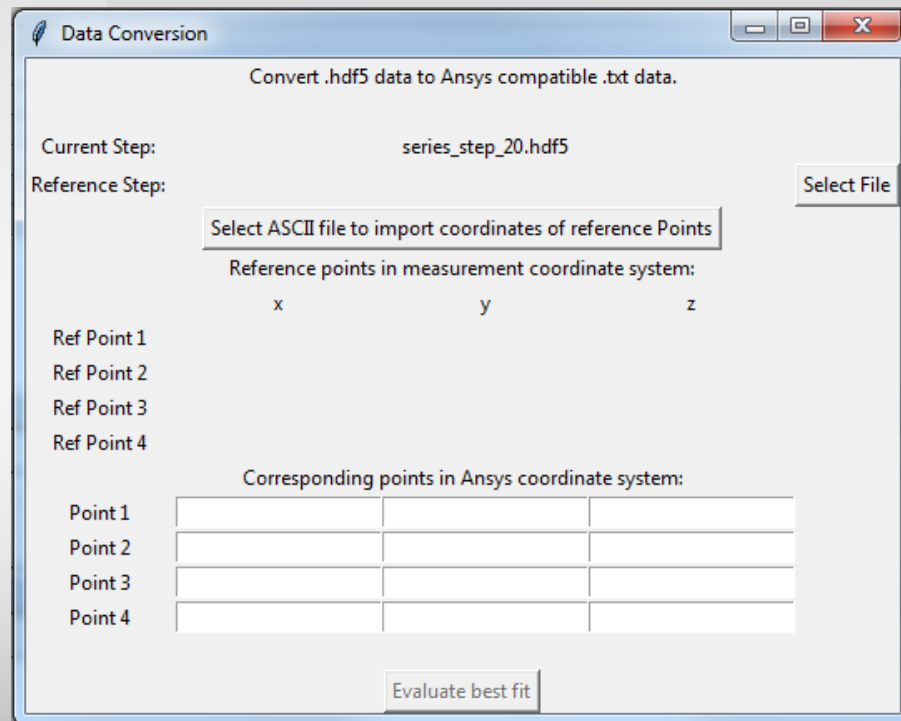
- Analysis Systems (Toolbox):** A list of various analysis types including Coupled Field Harmonic, Coupled Field Modal, Coupled Field Static, Coupled Field Transient, Eigenvalue Buckling, Electric, Explicit Dynamics, Fluid Flow - Blow Molding, Fluid Flow - Extrusion (Polyf), Fluid Flow (CFX), Fluid Flow (Fluent with Flue), Fluid Flow (Fluent), Fluid Flow (Polyflow), Harmonic Acoustics, Harmonic Response, Hydrodynamic Diffraction, Hydrodynamic Response, IC Engine (Fluent), LS-DYNA, LS-DYNA Restart, and Magnetostatic.
- Project Schematic:** A diagram showing the flow of data and parameters between different analysis systems. It includes:
 - Material Properties:** A block containing 'Engineering Data' (1) and 'Engineering Data' (2) with a checkmark.
 - Idealized Geometry:** A block containing 'Geometry' (1) and 'Geometry' (2) with a checkmark.
 - Import Measured Displacement Data:** A block containing 'External Data' (1) and 'Setup' (2) with a checkmark.
 - Measurement:** A block containing 'Static Structural' (1), 'Engineering Data' (2), 'Geometry' (3), 'Model' (4), 'Setup' (5), 'Solution' (6), and 'Results' (7), all with checkmarks.
 - FEA:** A block containing 'Static Structural' (1), 'Engineering Data' (2), 'Geometry' (3), 'Model' (4), 'Setup' (5), 'Solution' (6), and 'Results' (7), all with checkmarks.

Arrows indicate the flow of data and parameters between these blocks. A callout box on the right lists the following features:

- Complete template
- Based on test case 1
- All blocks filled with data and parameters
- Fully visible and functional
- Easy to adapt to user case

Below the callout box, two buttons are visible: 'Measure' and 'FEA'.

Data Conversion



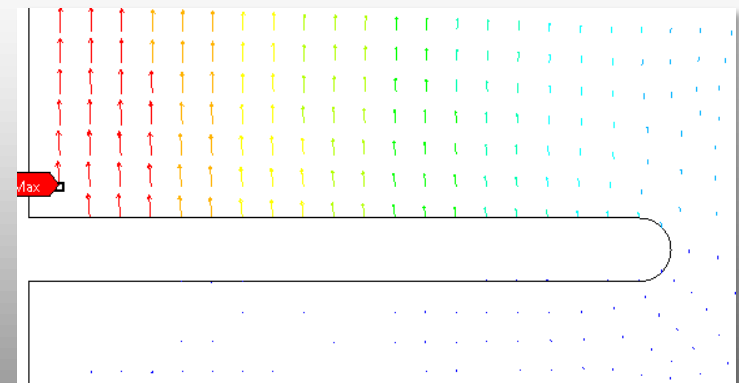
Reading .hdf5 data

Automatic transformation

- Based on reference points
- Least squares method

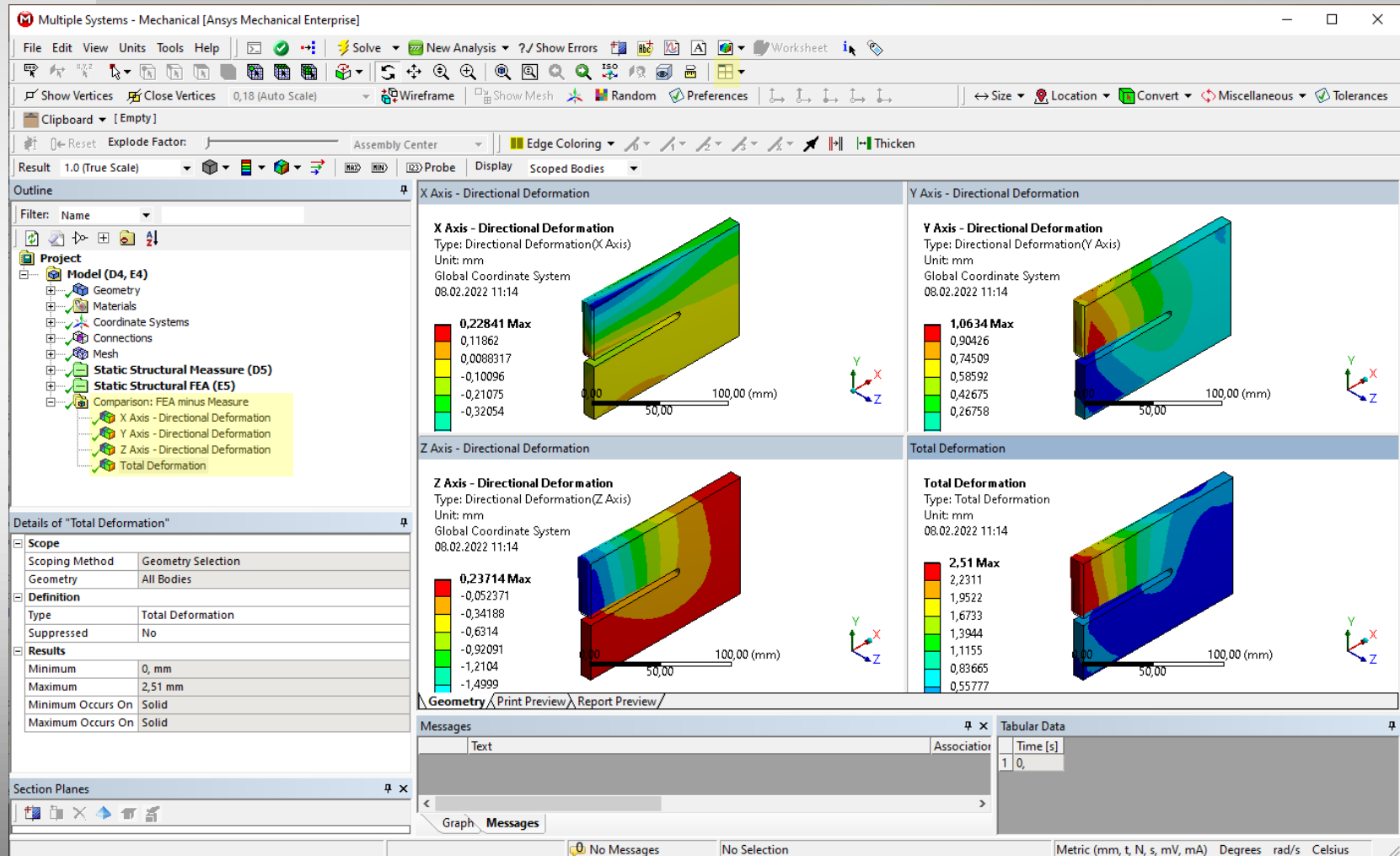
Visualization of measured data

- Mapped on the FEA geometry
- Location, amount, direction



Displaying Results

- Comparative Results (FEA - Measure) are now available directly in the Mechanical module.
- Switching to 4 viewports you can display 4 results simultaneously.



- Written in HTML
- Integrated in Dantec Dynamic main menu extension



Validation Tool: Documentation

This Guide offers you help on how to use the Dantec Dynamics Validation Tool.

Table of Contents

- [1. User's Guide](#)
- [2. HDF5 to TXT conversion Tool](#)
- [3. How to handle contacts in your Model](#)

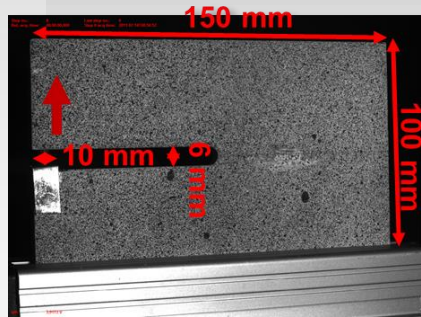
Examples

Case 1: S-Plate (Validation)

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Measurement

- Geometry



- Material:

- Arbitrary

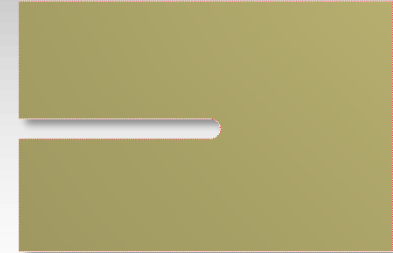
- Load / boundary conditions

- Measured displacement

FEA

- Geometry

- 3D

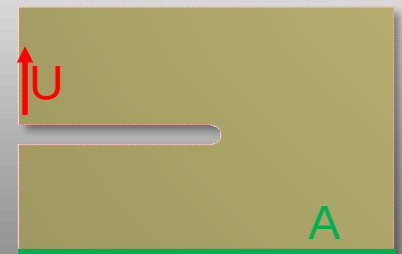


- Material:

Young's Modulus	3000	MPa
Poisson's Ratio	0,35	
Bulk Modulus	3,3333E+09	Pa
Shear Modulus	1,1111E+09	Pa

- Load / boundary conditions

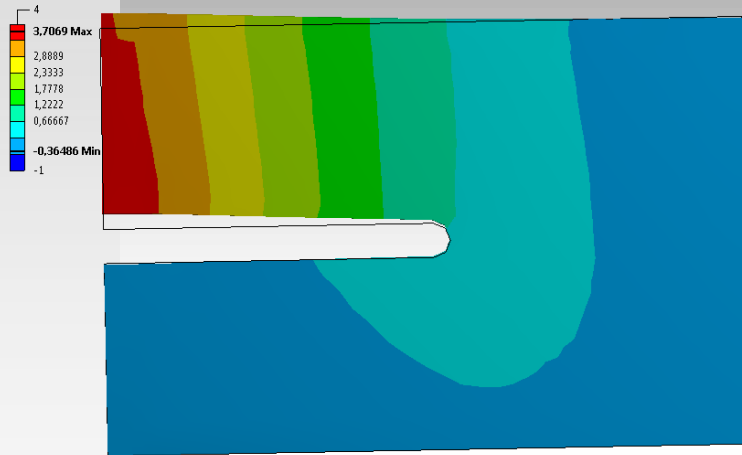
- U: Displacement load or force
- A: Fixation



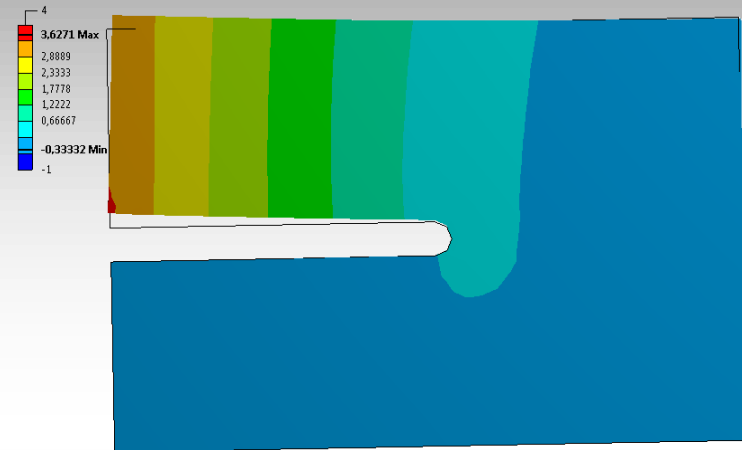
S-Plate: Results

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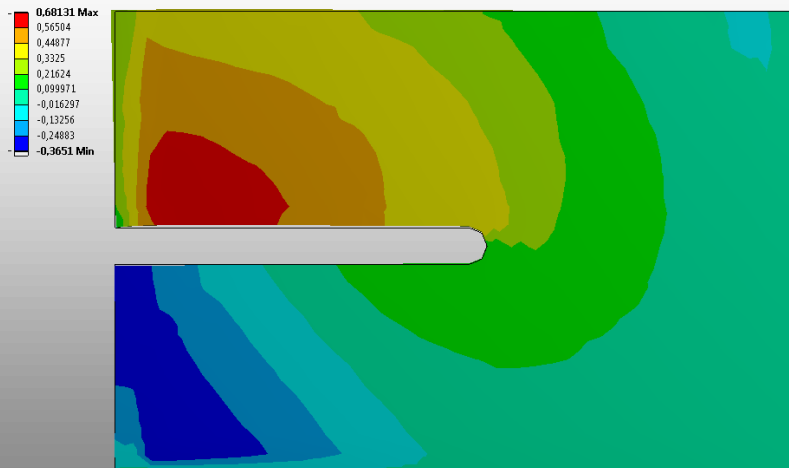
Measurement



FEA



Difference (FEA - Measure)



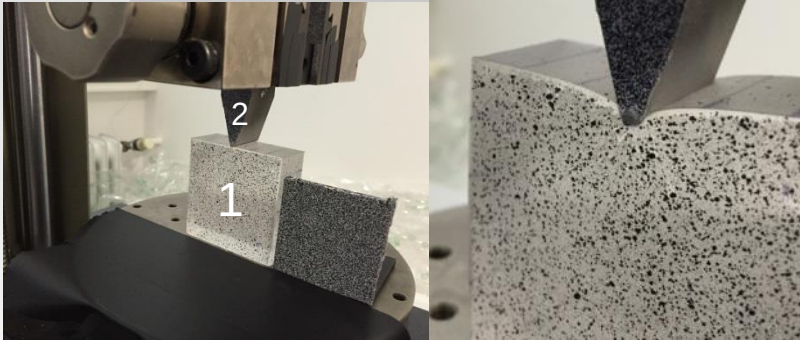
- Displacement differences in all 3 directions
 - Stresses, strains
- Answer: Fit or no fit

Case 2: Silicone Cube (Calibration)

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Measurement

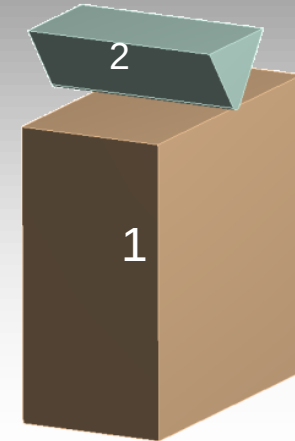
- Geometry



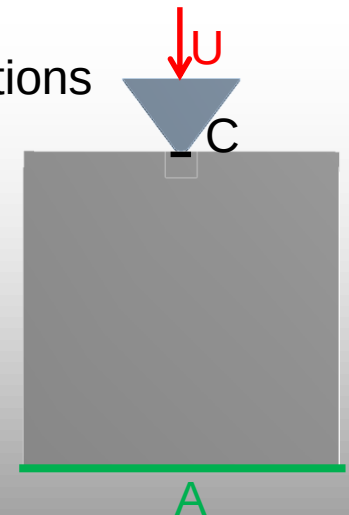
- Load / Boundary conditions
 - Measured displacements
- Material: arbitrary

FEA

- Geometry

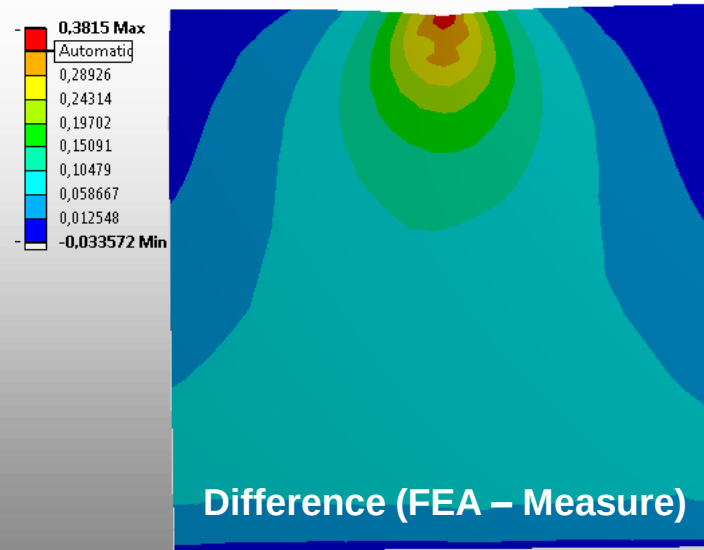
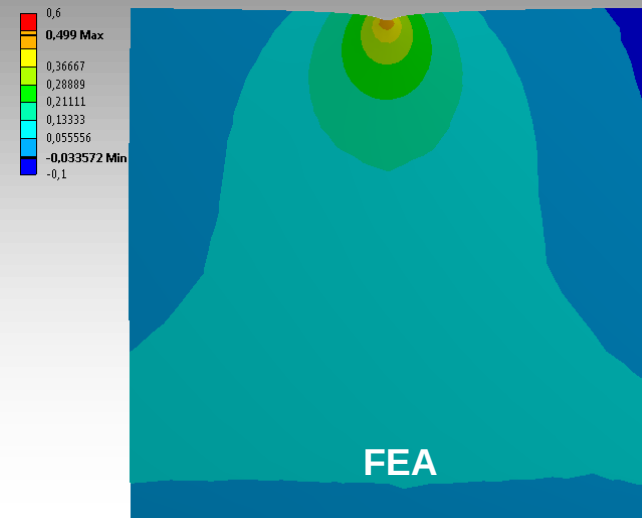
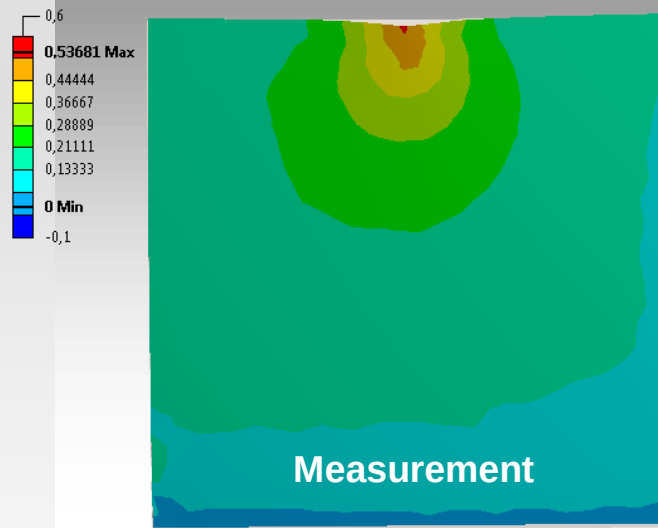


- Load / Boundary conditions
 - U: Displacement load
 - A: Fixation
 - C: Contacts with friction
- Material:
 - 1 Modified Silicone
 - 2 Aluminium



Silicone Cube: Results

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- Displacement differences in all 3 directions
 - Stresses, strains
- Answer: Fit or no fit