

# ANSA

## Latest Developments in v14.x.x

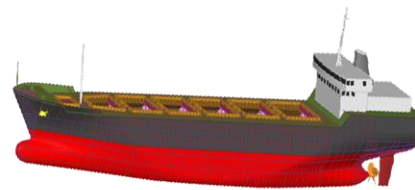
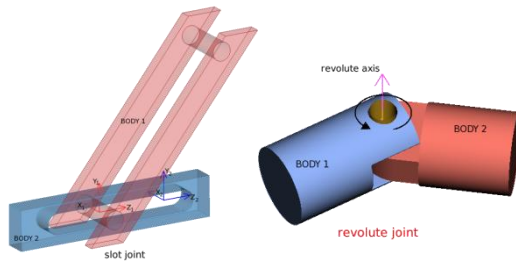
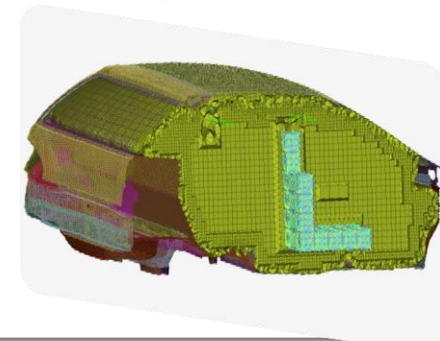
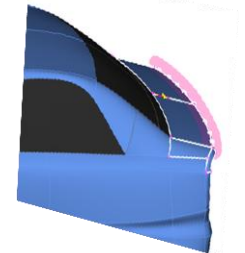
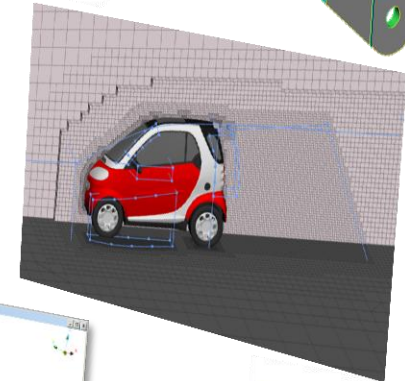
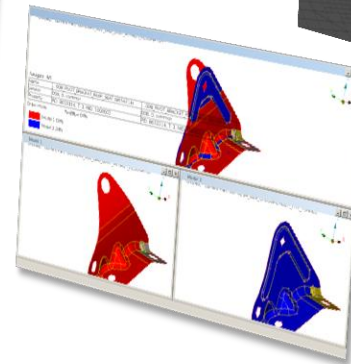
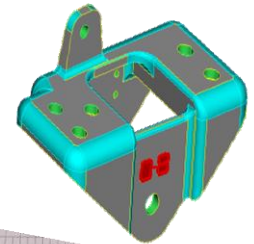
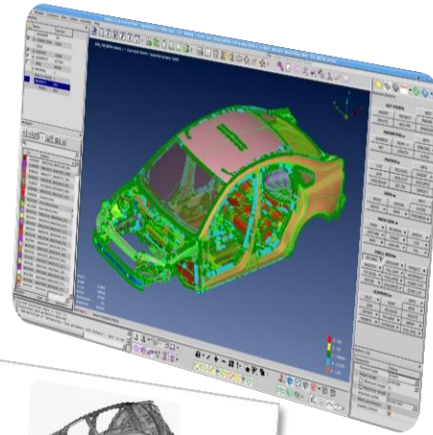
Konstantinos Kiouptsidis  
BETA CAE Systems S.A.



5-7 June 2013  
THE MET HOTEL  
Thessaloniki, Greece

## Latest Developments: v14.x.x

- User Interface
- Automation
- Geometry handling
- Meshing
- Model management
- Analysis tools
- Interface with solvers



## User interface

### Toolbars/Layout

- Color coded
  - Eye catcher buttons
- Lighter menu
  - Larger graphic area
- Customization

### Selections

- New & enhanced options
- On screen context menus
  - Isolation
  - Direct & Quick access to functions
  - Settings Configuration

### Performance

- Larger model handlings
- Quick response

**Ergonomics**

**Productivity**

**Reliability**

# New Toolbars

ANSA v14.0.0 64-bit - Updated\_13-DEC-doc\_v14\_ANSA (/mnt/raid\_disk/DATA/ndrivako/DOCS/v140x\_Whats\_New/files/BIG\_TO\_BETA.ansa)

Database

Name	Number
ANSAPART	267
CONNECTION	5266
EDGE	
ELEMENT	25898
GEOMETRY	427189
GRID	30266
MATERIAL	1
Nastran Header	1
PROPERTY	293
PSHELL	293

PROPERTY

Id	Name
3538038	08652108_08652108_004...
3538039	08650521_08650521_006...
3538040	08625771_08625771_004...
3538042	08625614_08625614_005...
3538043	03538043_03538043_006...
5000000	08652028_08652028_010...
5000001	Svetsmuttrar
8620184	Front Windscreen 4
8622696	Rear Windscreen 3
8625542	08625542_08625542_016...
8625543	08625543_08625543_015...
8625544	08625544_08625544_013...
8625545	08625545_08625544_013...
8625546	08625546_08625546_015...
8625547	08625547_08625546_015...
8625550	08625550_08625550_009...
8625555	08625555_08625555_020...
8625557	08625557_08625557_013...
8625563	08625563_08625563_020...
8625564	08625564_08625564_018...
8625565	08625565_08625565_011...
8625566	08625566_08625566_012...
8625567	08625567_08625567_017...

Shell  
quads : 15388  
trias : 10510  
total : 25898  
Unchecked : 54  
Unmeshed : 49268

PROPERTY total 293 selected 0

RECONS Select CQUAD4,CTRIA3

Current distortion angle: 0. (old: 0.)  
Inconsistent mesh parameters detected:  
- Bad definition of 'Defeaturing > Join perimeters with distance': 'Lmin' is not

Eye catcher icon buttons

Quick access

Larger graphic area

Flexibility



## Color coded Toolbars



### Containers

- Part Manager
- DM functionalities
- SET / PID /MID lists
- Includes lists
- Filters
- Database Browser



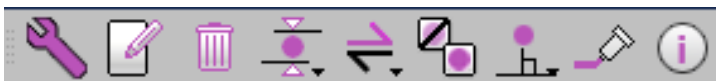
### Tools

- Batch Mesh
- Compare
- Task Manager
- Scripts
- NVH Console
- Includes Manager
- Checks



### Utilities

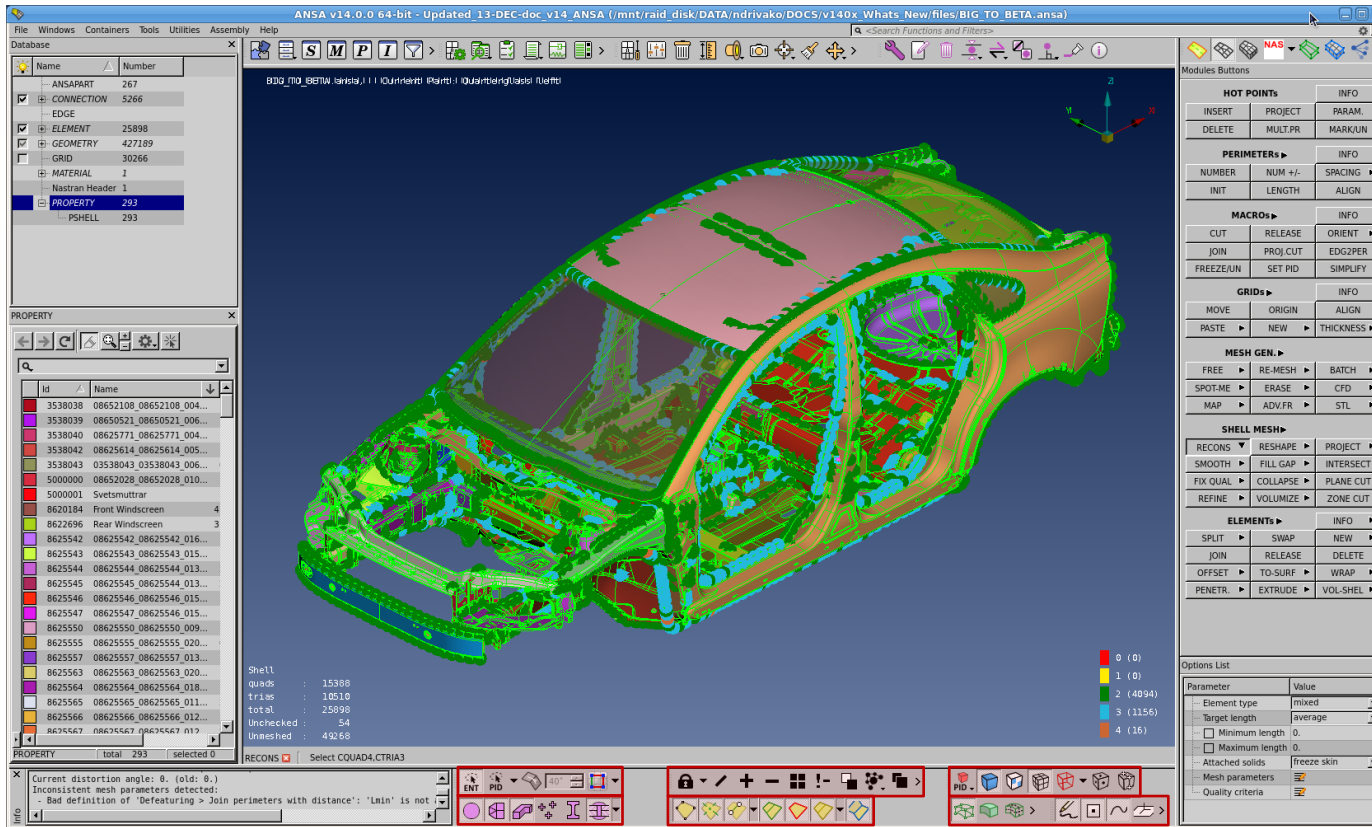
- Mesh Parameters
- Quality criteria
- Delete
- Measure
- Isolate
- TRANSF.
- Deck Info
- Renumber



### Assembly

- Define Connections
- Connection manager
- Con. Template
- Erase
- Convert
- Remove Double

# Eye catcher Toolbars



## Selection Assistant



## Focus Functions



## Drawing Styles



## Feature Vis.



## Faces Draw



## Morph - Auxiliaries



# Selections

## Selections

- New & enhanced options
- On screen context menus
  - Isolation
  - Direct & Quick access to functions
  - Settings Configuration

Shell	
quads	: 440109
trias	: 93665
total	: 533774
Off	: 139243
Unmeshed	: 353

Context menu options:

- Show
- Hide
- Show Only
- Show Only Worst
- Fix Quality
- Reconstruct
- Reshape
- Collapse
- Expand level 3

## Handling of visibility and improvement

- Mesh improvement
- Unchecked
- Unmeshed

## On screen context menu

Context menu options:

- Show
- Hide
- Show Only
- Show Only Worst
- skewness (shells) PATRAN 50.
- skewness (solids) FLUENT 0.5
- Edit Criteria Visibility
- Show Inactive Criteria
- Hide Inactive Criteria

Legend:

- Skewness
- Warping
- Taper
- Angle
- Min Length
- Max Length

## Selection Assistant

Selection Assistant toolbar icons:

- ENT (Entity Selection)
- PID (Pick)
- Angle (40°)
- Selection Assistant (Grid)

## Wizard interface

- Intuitive
- Step-by-step
- Instructions
- Backward-Forward

RBE2 Many Nodes

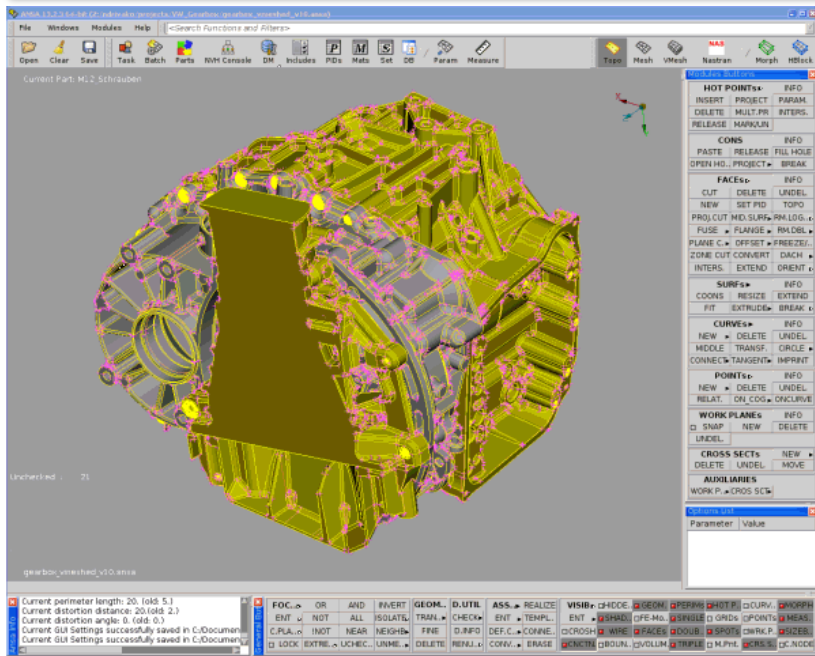
Slaves  
Master  
**Finish**

**Create Entity**

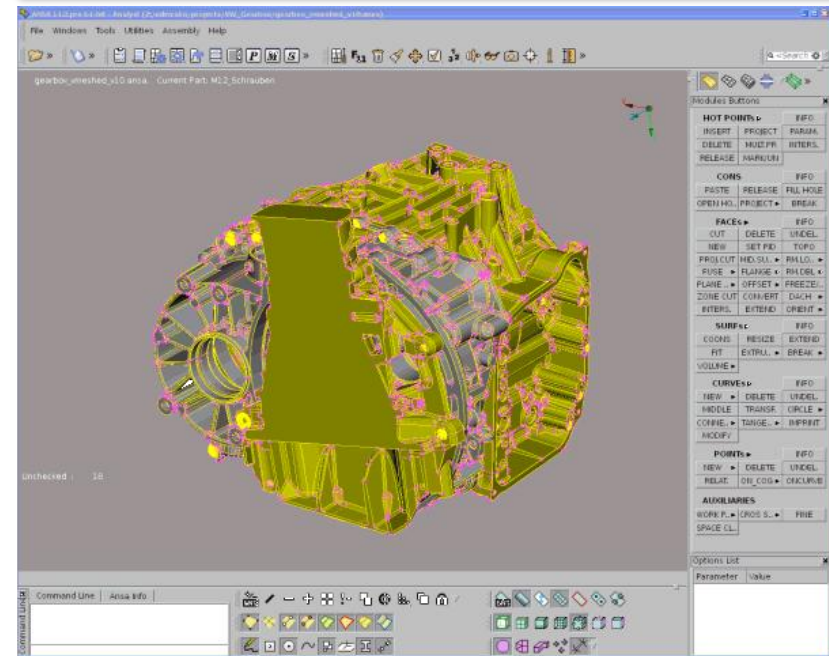
EID	3122
GN	769
No.of.Nodes	7
CM	<input type="text" value="123456"/>
On Set	<input checked="" type="checkbox"/>

# Performance

v13.2.x



v14.0.0



- Improvement in rotation speed of geometry
- Use of graphical card capabilities
- Larger model handlings
- Quick response



## Automation

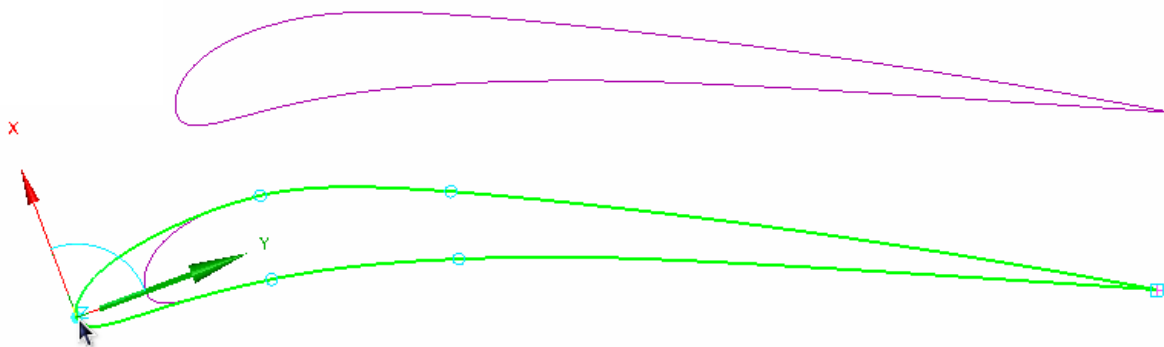
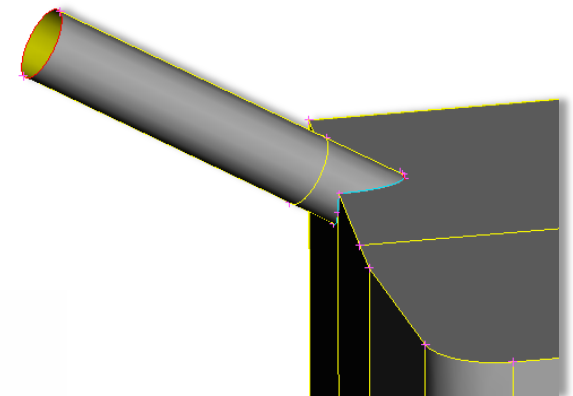
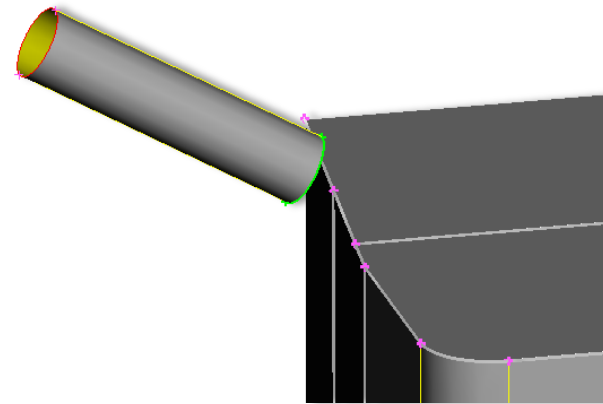
### Python programming language in scripting

- High level object oriented programming language
- Clean and expressive syntax
- Large standard library
- Large selection of third party scientific libraries
- Language of choice for computation science and engineering
- The new ANSA API in an extension of Python
- Python v3.3



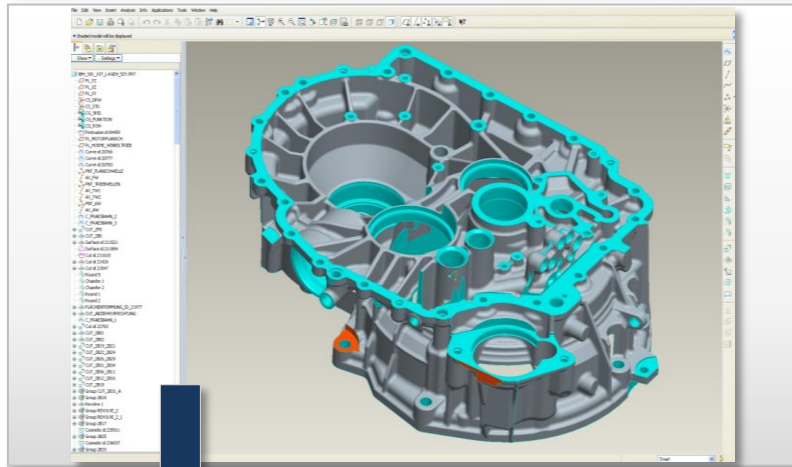
# Geometry

- Open native CAD files
- Curves manipulation
- Primitive volume shape creation
- Enhanced Intersections
- Bridge with SpaceClaim
- Middle Surface Extraction

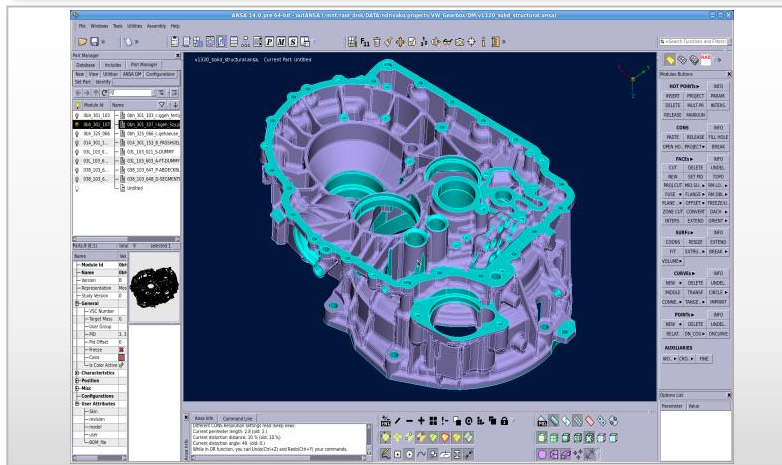


# Geometry

From CAD ...



... directly to ANSA



- Open native CAD files in ANSA
- Catia, NX, ProEngineer, SolidWorks, Inventor and Parasolid files

Options

**Hierarchy**

Preview assemblies

Force single part

Write log

**Geometry**

Generate 3D curves of faces

Read construction surfaces

Use ANSA colors for PIDs

Body to PID

Part to PID

Layer to PID

Color to PID

Single PID

Create volumes

Create sets

Use orientation vector

Use thickness lines

Use material vector

**Filter**

Read hidden entities

Read visible layers

Include layers

Exclude layers

Read free geometry

Read attributes

**Topology**

Perform ANSA topology

Topology between PIDs

Topology between parts

Clean geometry

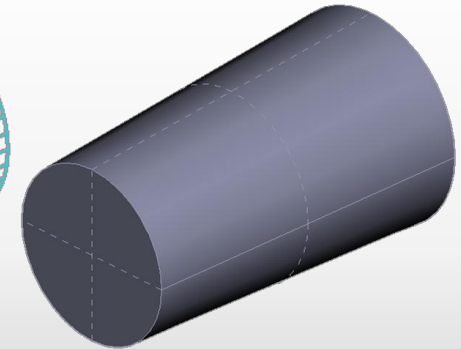
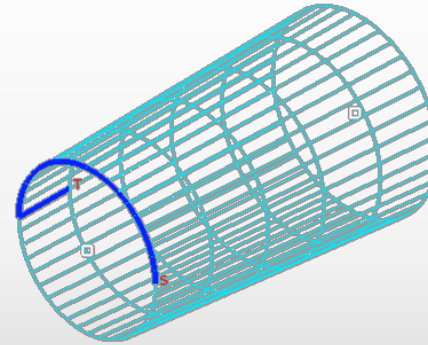
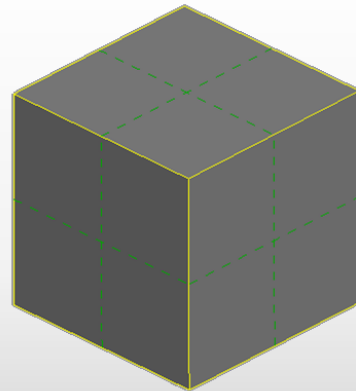
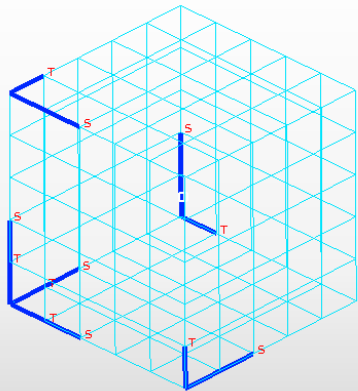
Heal model

Clean the geometry (use

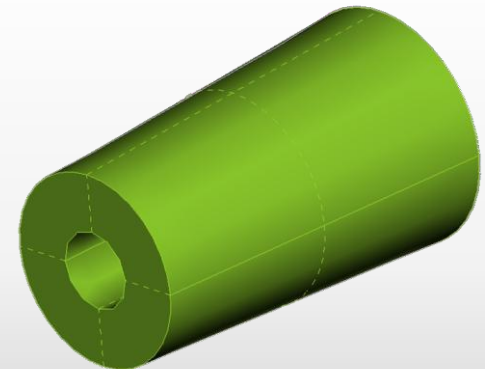
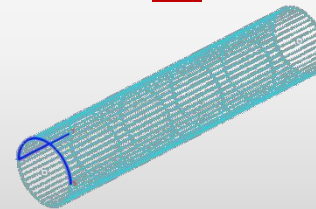
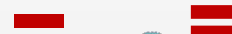
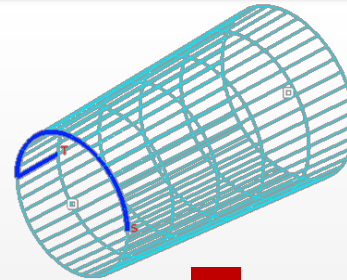
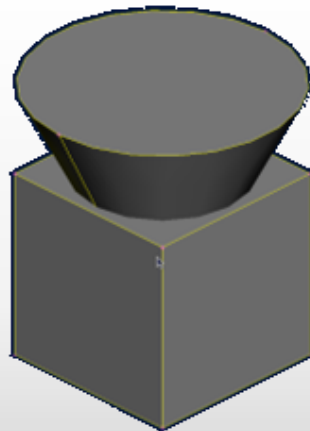
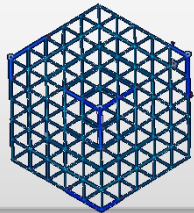
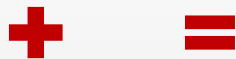
**Quick and direct access !**

# Geometry - Volume handling

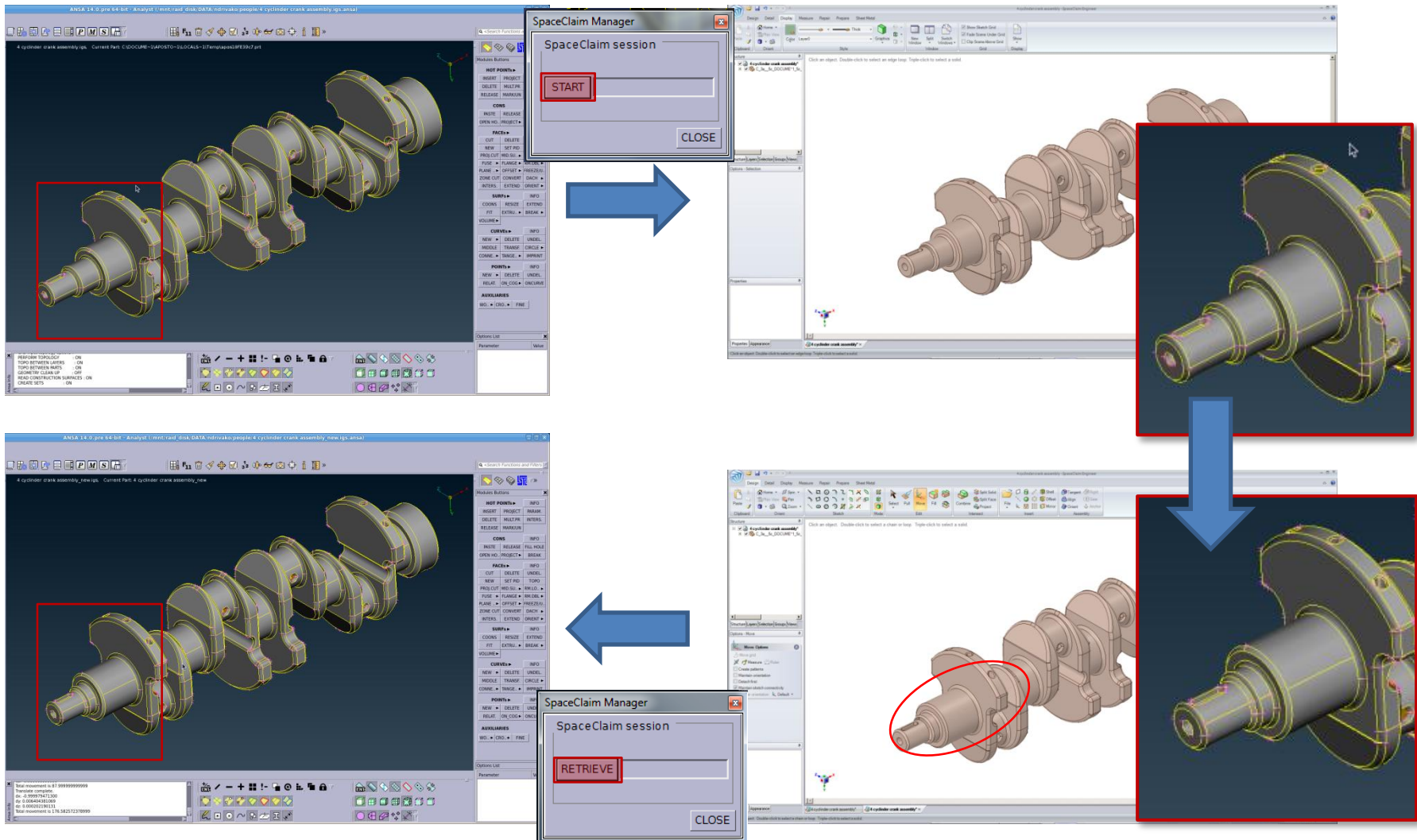
## Easy primitive volume creation



## Boolean Operations between volumes



# ANSA - SpaceClaim interaction

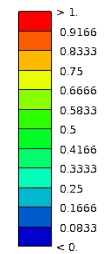
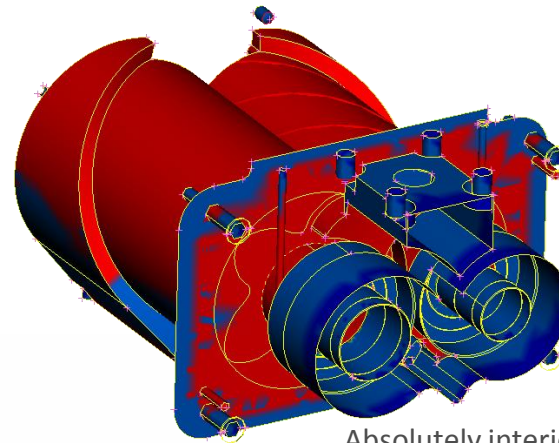
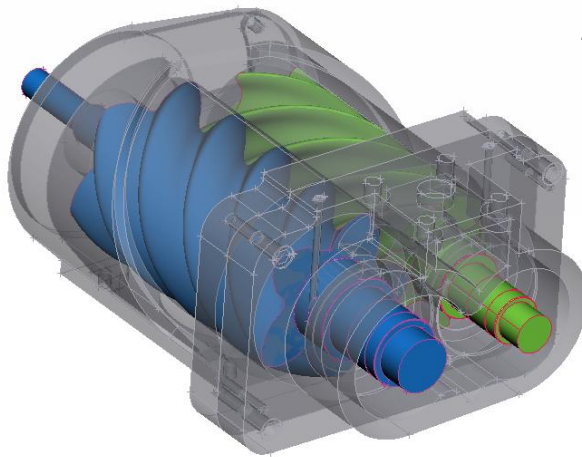


- Direct access to SpaceClaim (Windows OS)

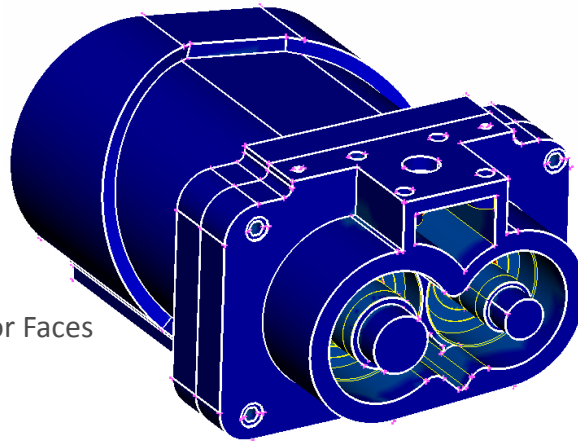


## Isolation techniques: Exterior - Interior

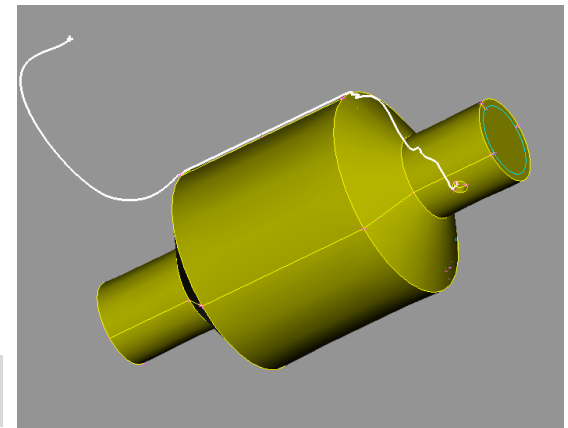
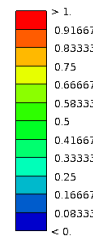
Alternative functionality for identification and isolation of outer or inner surfaces



Absolutely interior Faces

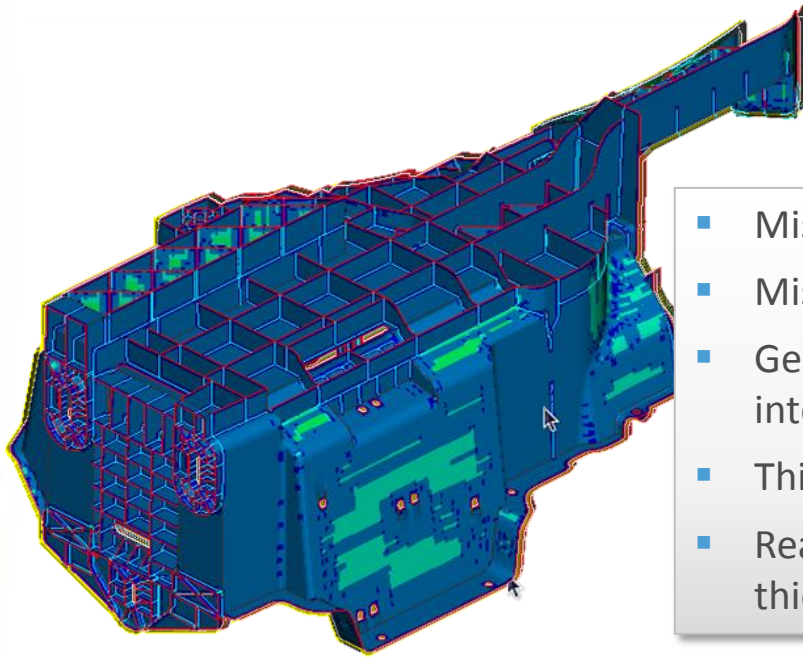


Absolutely exterior Faces



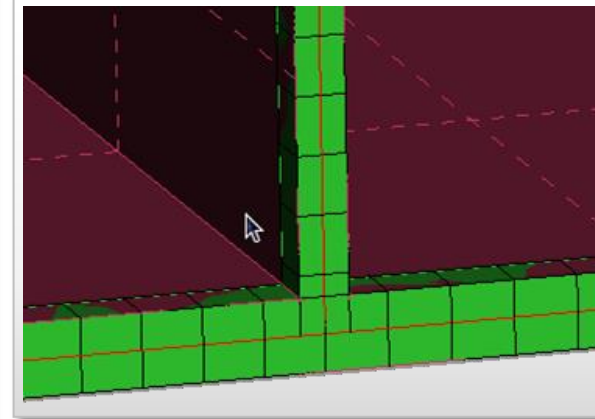
Inner/Outer "Skin": leak check & "seed" points control

# Middle Surface Creation for Cast Parts

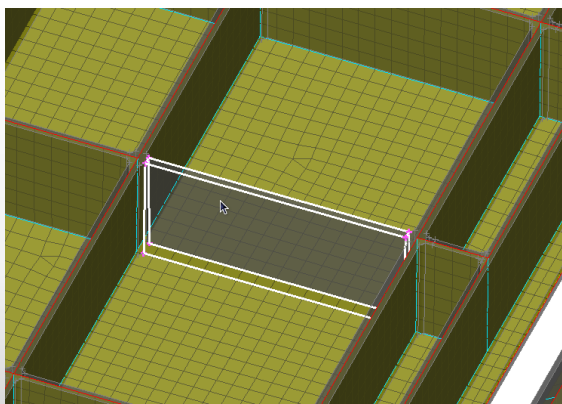


- Missing middle FE
- Missing Initial Geometry
- Geometry - FE intersection
- Thickness Penetration
- Reassignment of nodal thickness

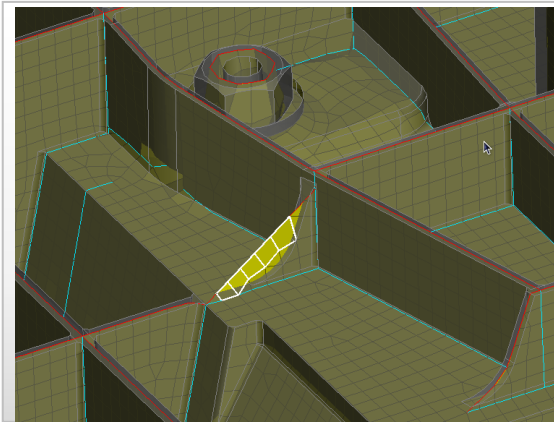
## Nodal Thickness



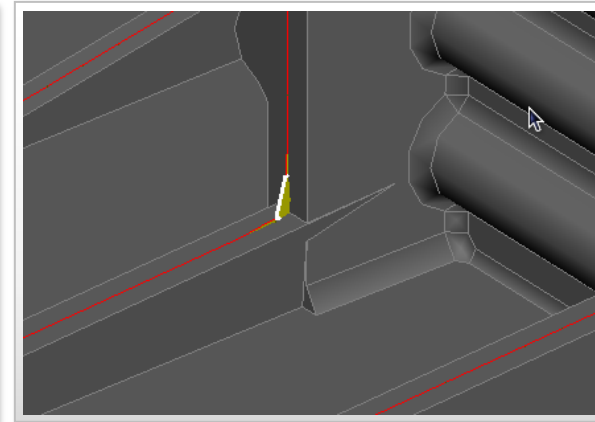
## Missing Middle



## Missing Initial Geometry

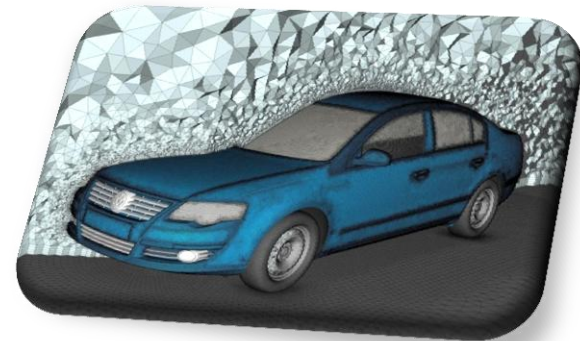


## Intersections



# Meshing

- De-featuring
- Features treatment
- Mesh healing tools
  - Watertight model creation functions
- Volume meshing
  - Hexa-mesh



**Robustness and quality improvement of Surface Meshing tools**

**Full robustness and fewer elements with Tetra Rapid, HexaInterior and HexaPoly**

# Treatment per feature

Mesh Parameters

Name: BETA-CAE Parameters

Basic Perimeters Features Fix Quality Volume Mesh

S/N	△	min rows	max rows	min radius	max radius	min width	max width	min angle	max angle
8	1	1		13.8363	31.2403	2.76186	3.89529	7.1441	11.4368
9	1	1		25.9333	69801	0.330786	0.528079	0.00041817...	0.984794
10	1	1		14.3266	14608.5	0.500609	0.750902	0.00204311	2.76255
11	2	2		5.67006	6.25934	7.87621	9.43729	72.096	90.1405
12	2	2		16.3098	21.6307	17.913	23.8815	62.9278	63.2578
13	2	2		12.9999	13.0001	7.38711	12.8269	32.5577	56.5328
14	1	2		2.84352	30.9054	2.11428	25.4655	40.3741	80.0707
15	1	2		9.99984	10.0002	2.3672	7.52796	13.563	43.132
16	1	2		9.99995	10	2.69305	8.04058	15.43	46.0691
17	2	2		19.5663	19.9889	10.8552	11.082	31.7653	31.7872
18	1	1		15.6323	19.7591	3.4918	3.55119	10.1803	13.0158
19	1	1		9.99995	12.1828	3.75066	6.1034	21.4897	32.7794

Improve Identify

total 389 selected 1

Fillets

Min.Radius	Max.Radius	Min.Width	Max.Width	Treatment
50.		0.	7.	1
50.		7.	50.	2
Default	-	-	-	min

Options

Separate internal and external fillet treatment

Always create even rows of elements

Do not join perimeters created from split treatment

OK Cancel

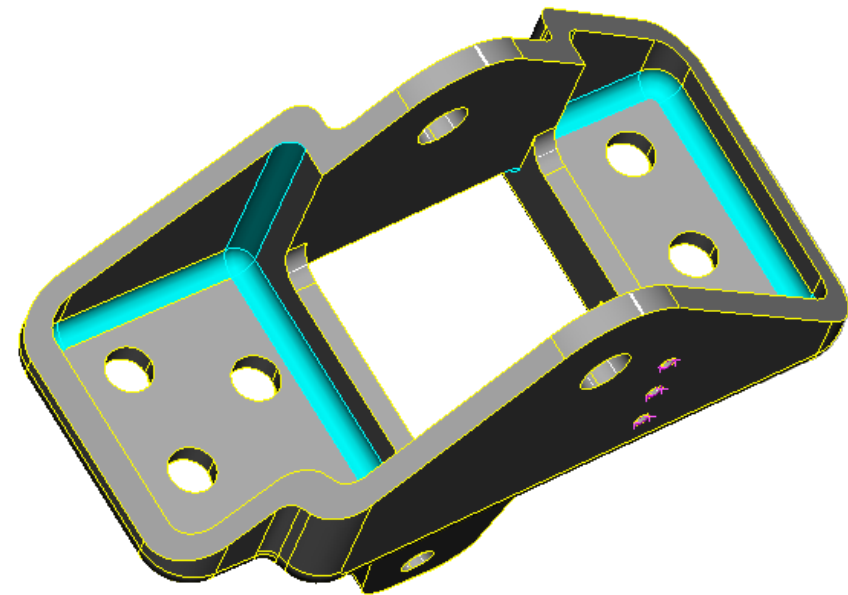
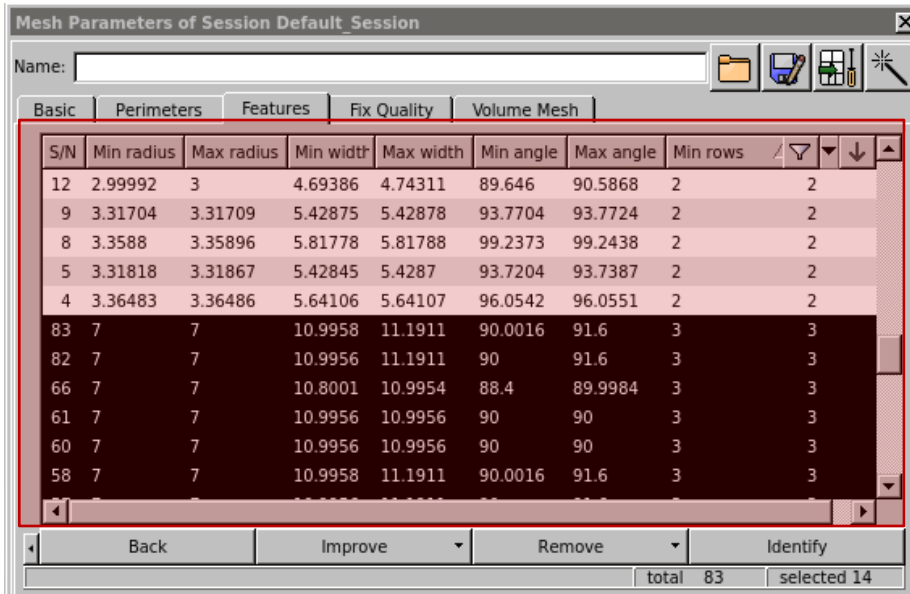
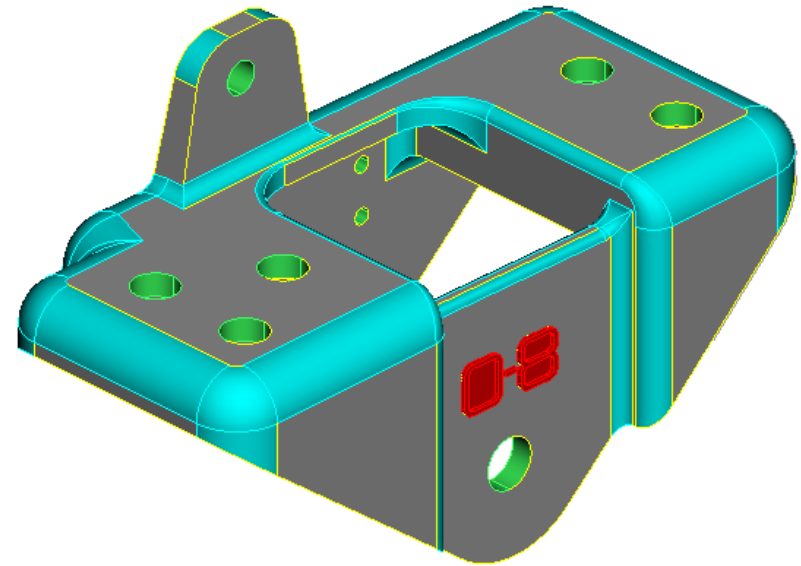
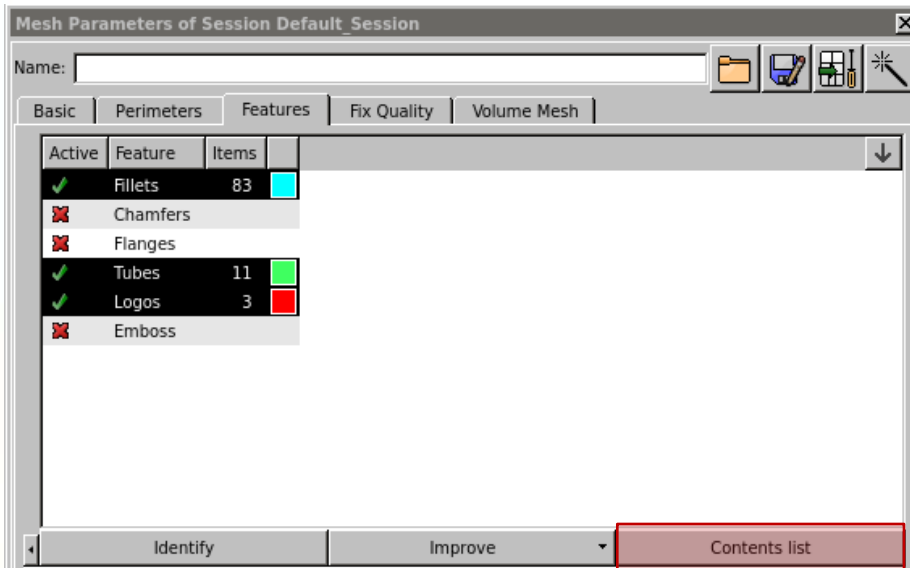
## Feature Oriented Meshing

- Fillets
- Chamfers
- Flanges
- Holes
- Tubes
- Logos
- Emboss

## Actions

- Identify
- Overview
- De-feature
- Improve
- Isolate

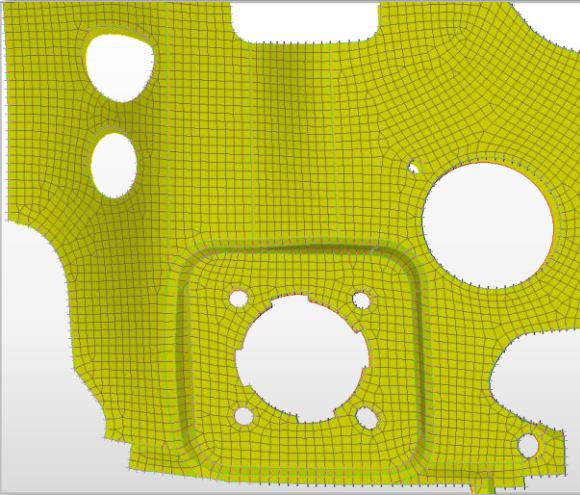
# Treatment per feature



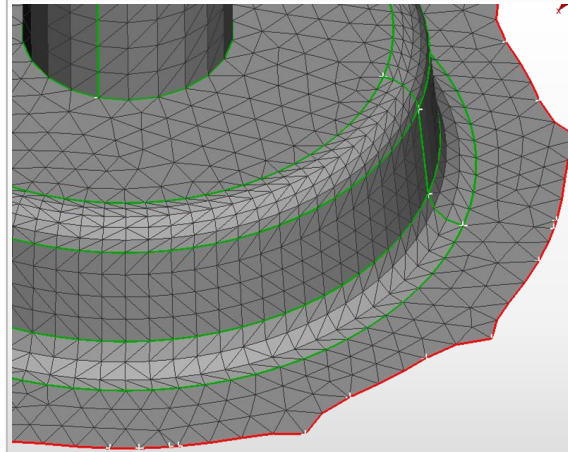


## Treatment per feature

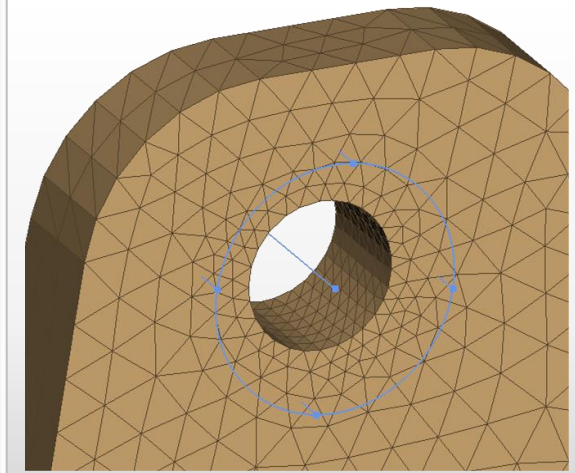
Holes Orientation



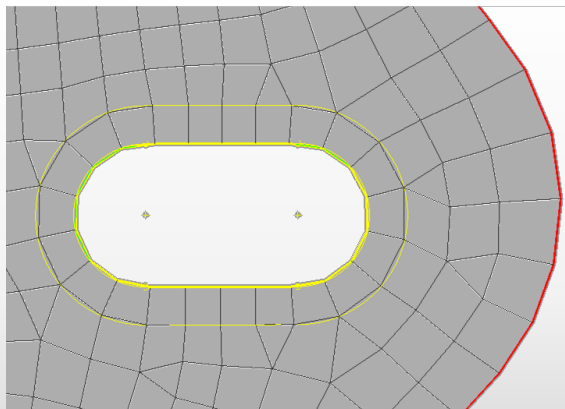
Inner / Outer Fillet



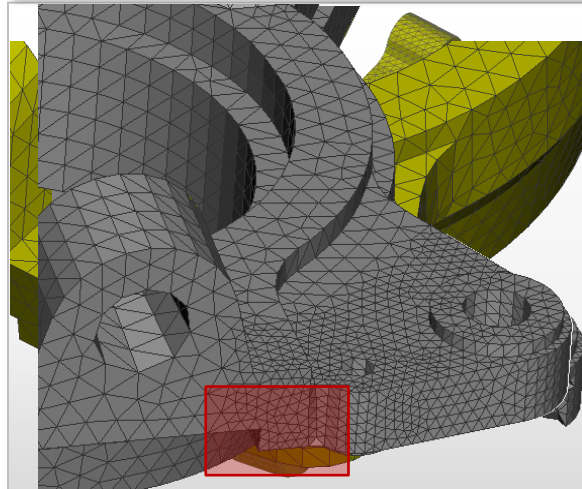
Size boxes



Oblong Holes



Shell - Solid Improvement



Automatic re-mesh for:

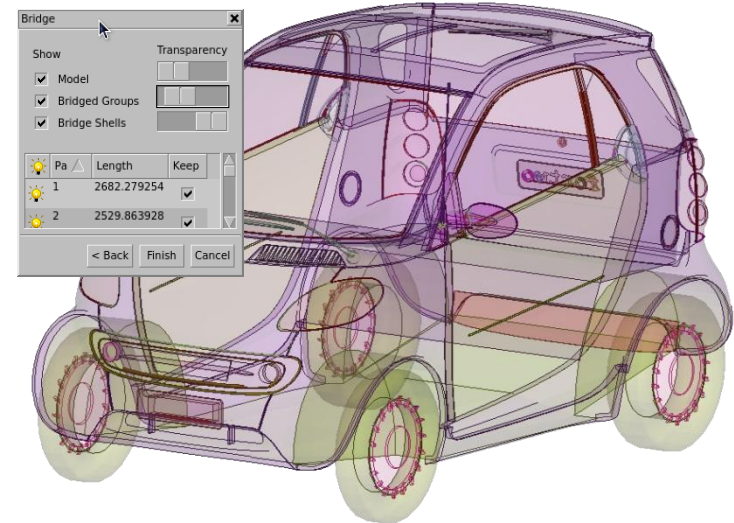
- Shell / Shell & Solid / Solid
- Boundary Layers

Any function:

- Recons / Reshape / Fix -Qual
- Split / Swap / Join
- Layers

# Closing gaps – watertight model

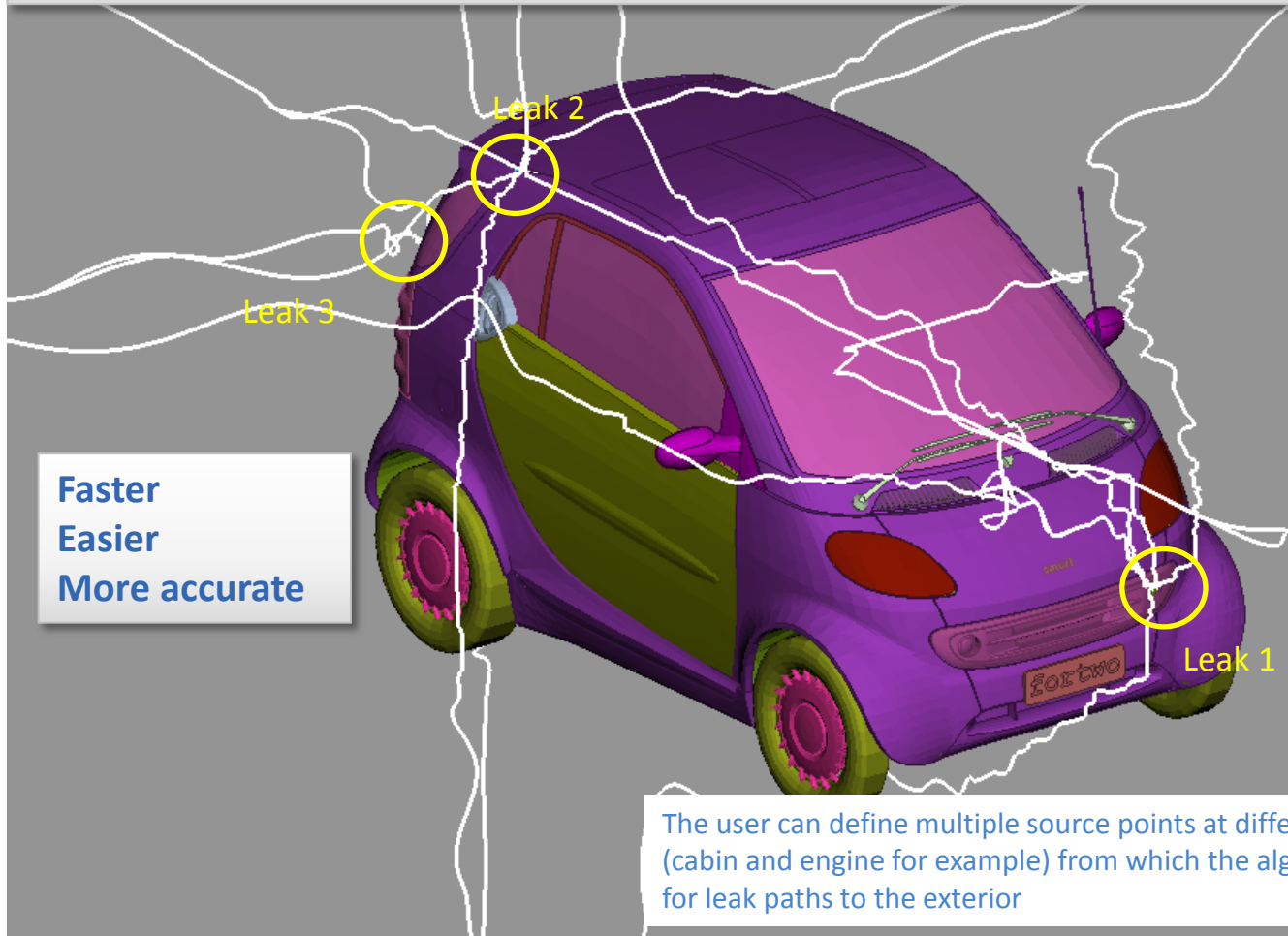
FILL GAP [Seal] function accelerates creation of watertight models for surface wrapping



## CFD watertight model tools

### Surface wrapping – leak check enhancements

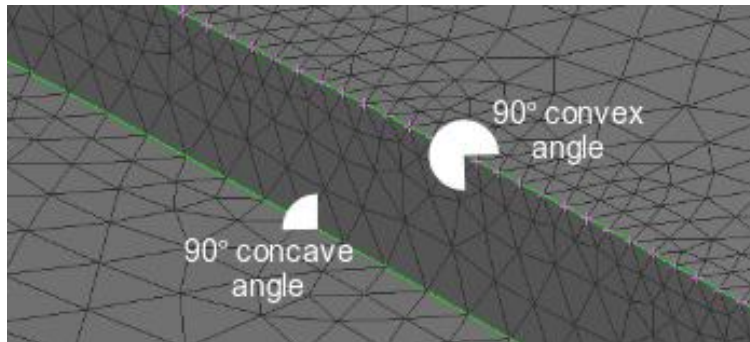
Ability to track multiple leaking paths to the exterior from multiple interior source points, making it easier to identify several leak areas simultaneously



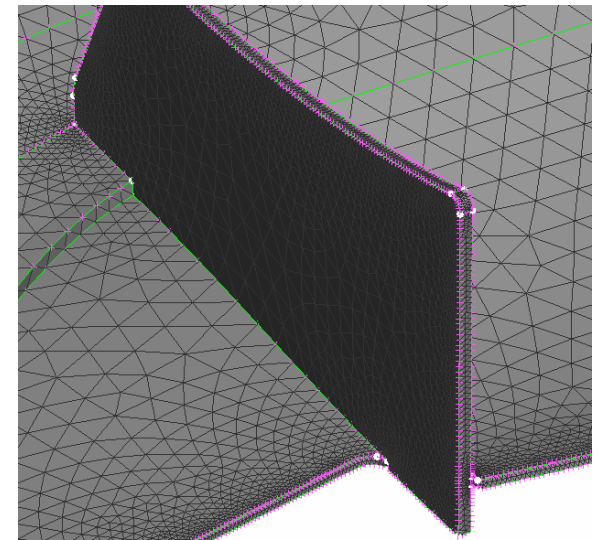


## CFD Meshing enhancements

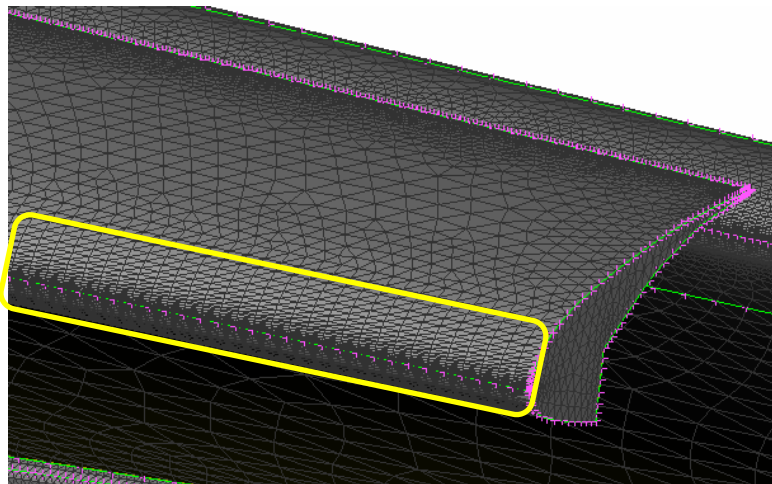
Control convex and concave sharp angle length independently



Automatic Trailing edge identification, element length as a factor of trailing edge width



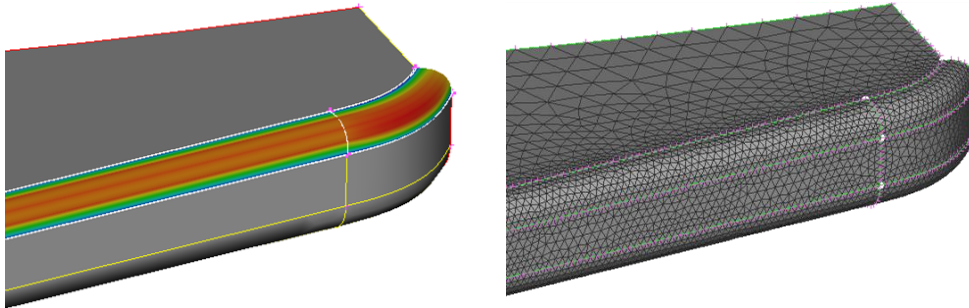
Anisotropic meshing of leading edges



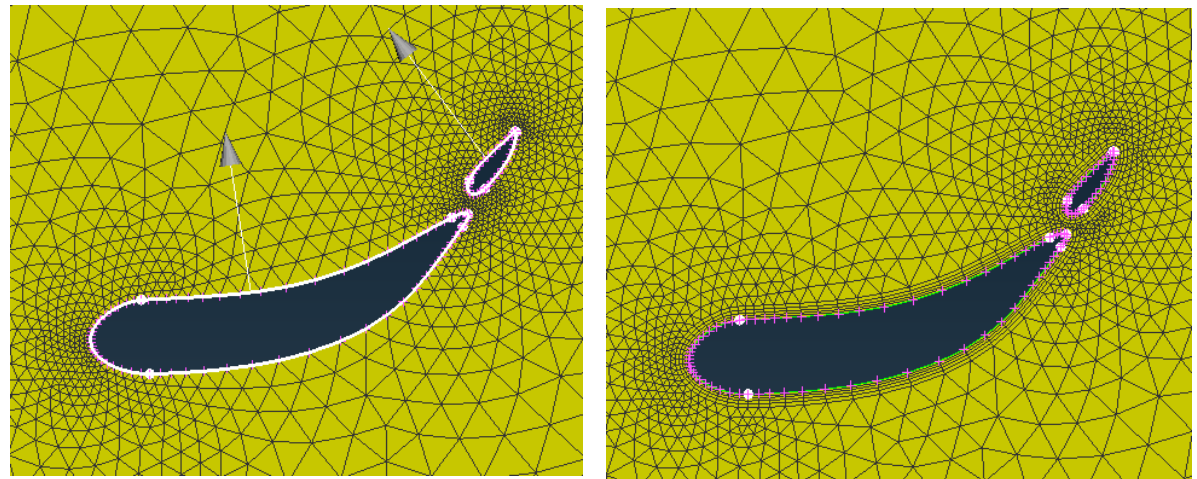
## CFD Meshing enhancements

Better refinement of fillets with zero curvature at the ends and “peak” in the middle

*Curvature contour plot showing peak along the middle of the fillet*



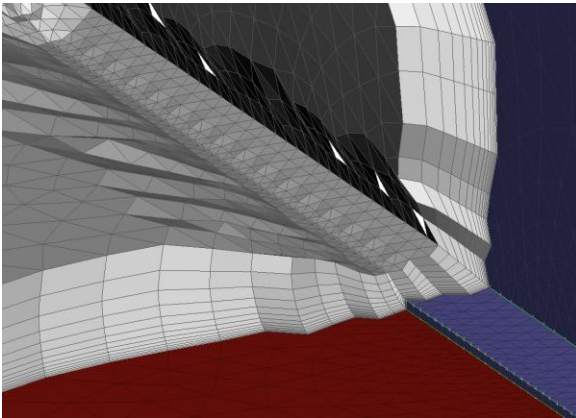
Generation of 2D layers from selected Perimeters



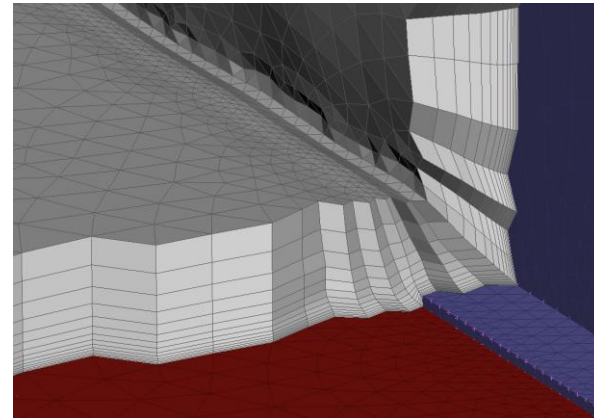


## Layer generation improvements

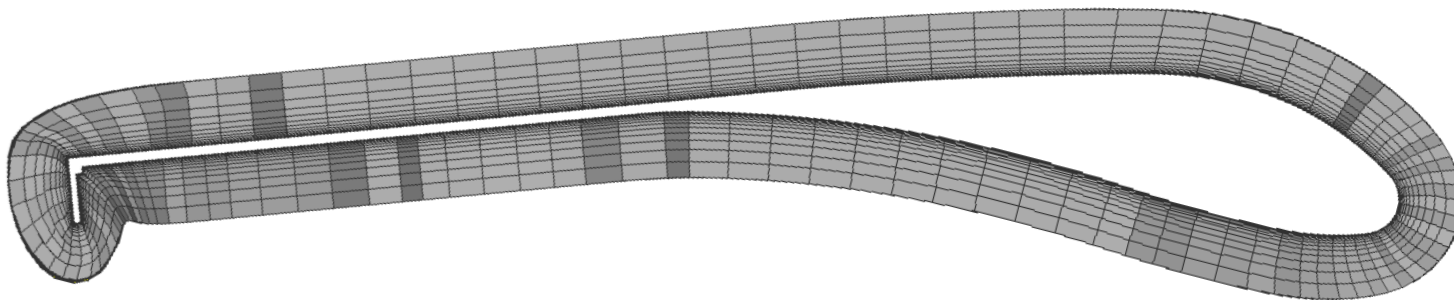
- Improved algorithm performance at high angles
- Better orthogonality near the wall
- Better layer top cap quality
- Less layers squeezing required



Layer squeezing at high angles



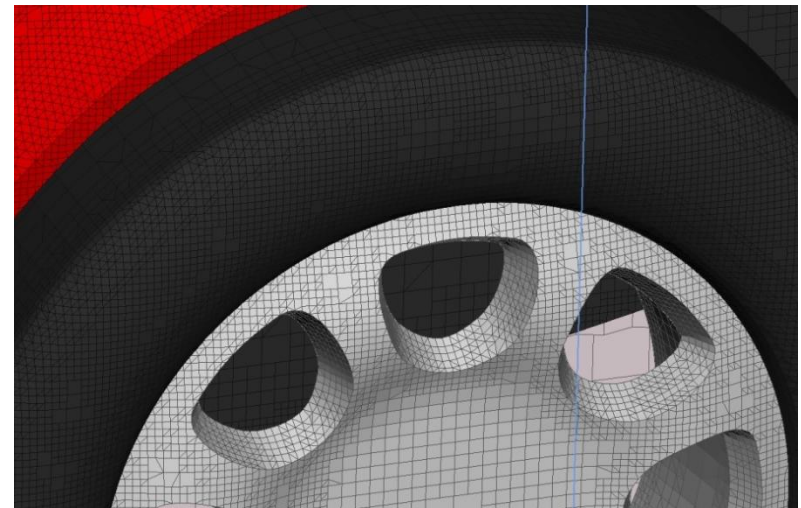
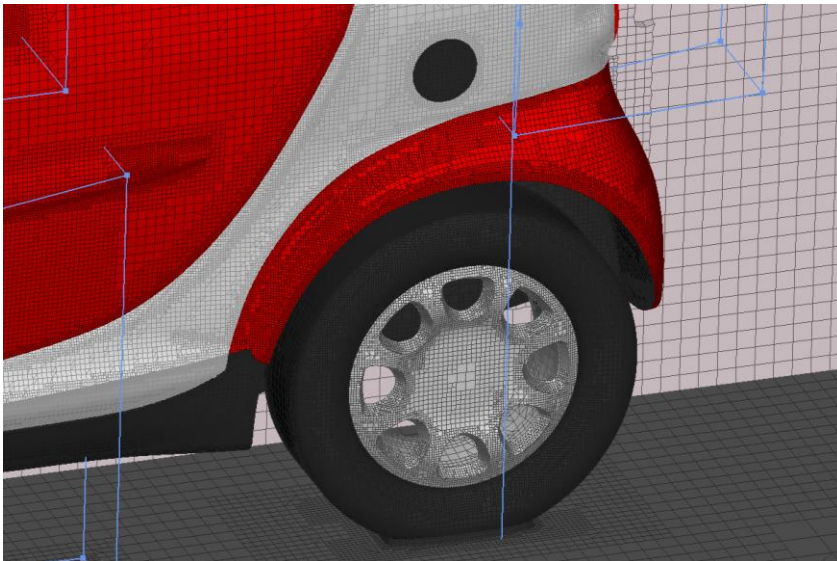
NEW vector smoothing for full height at extreme angles



## CFD: Volume Meshing

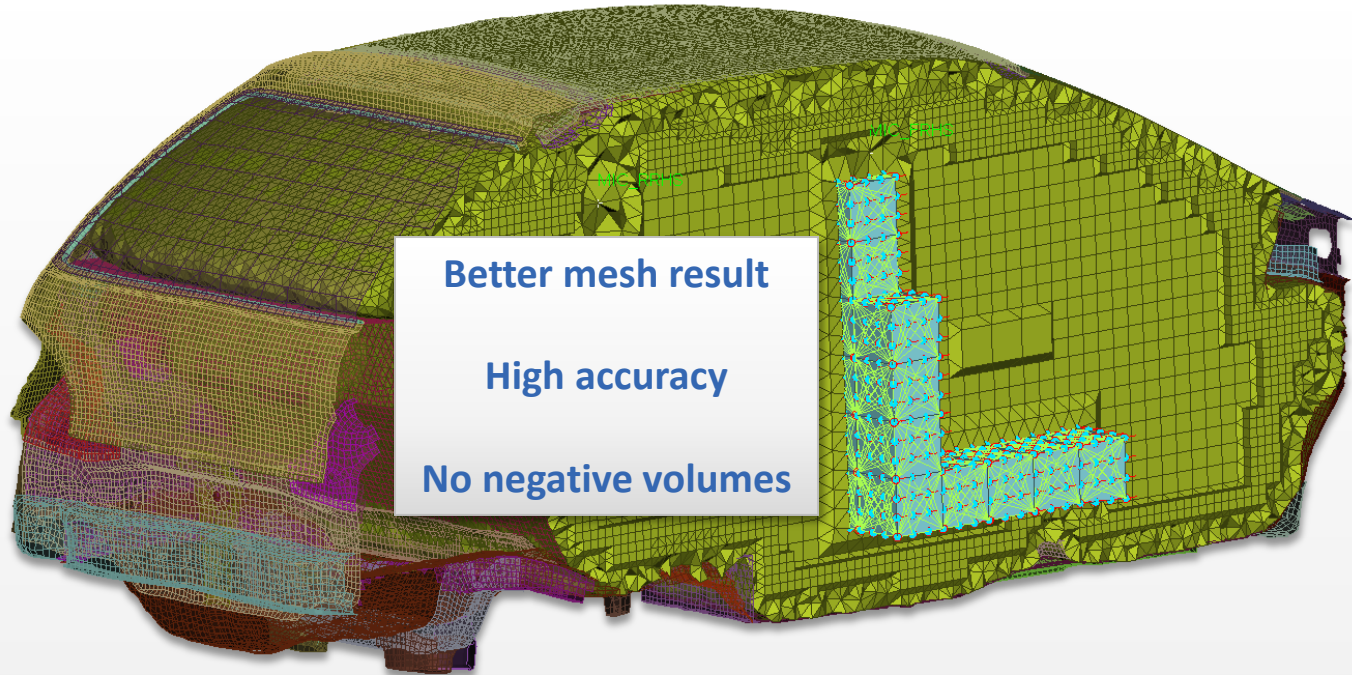
### HEXTREME (hexa -polyhedral)

- HEXTREME: new volume meshing algorithm
- Multi-core operation
- Fully automated and highly controllable
- Hexa-dominant and polyhedral mesh
- No need of watertight volume definitions



## NVH : Volume Meshing

### New Cavity Wizard

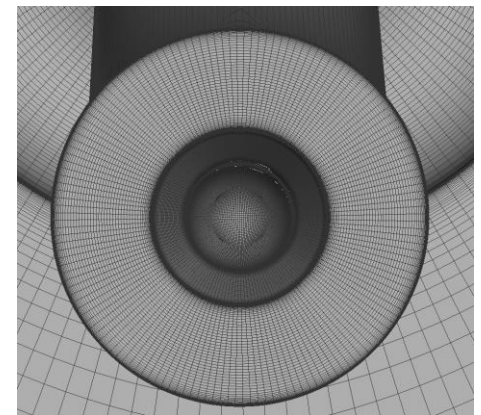
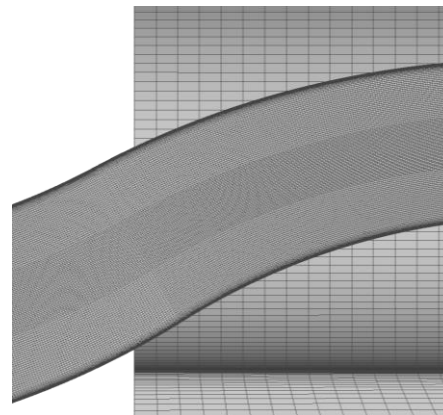
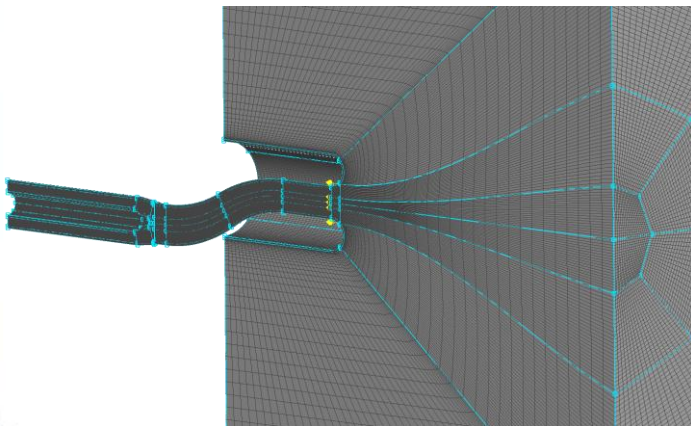
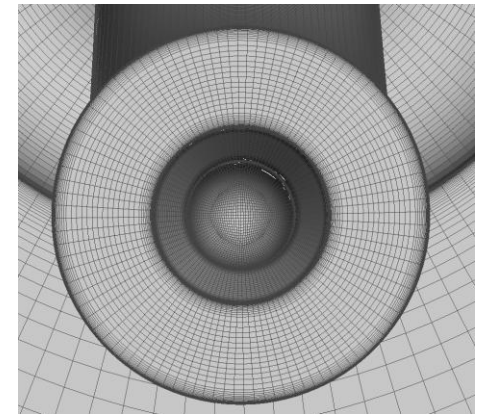
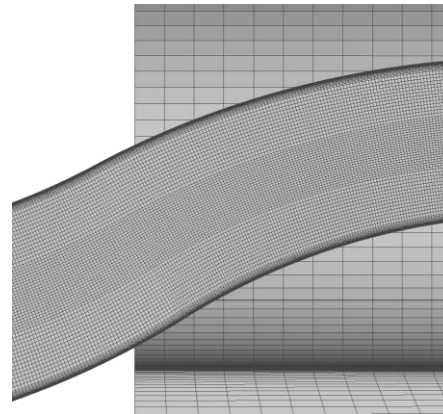
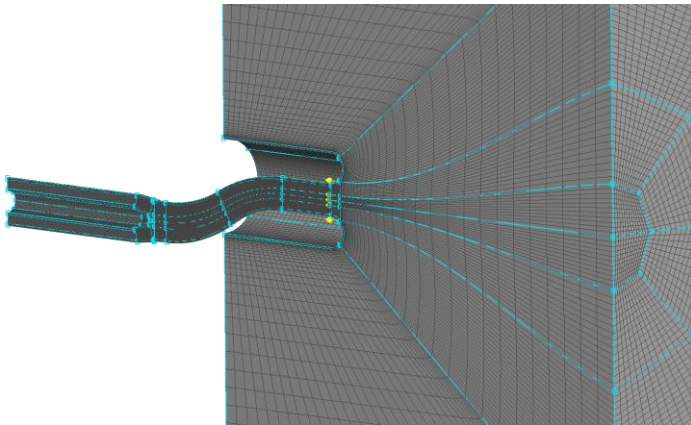


- Wizard functionality allowing backward steps and re-setting
- Two types of volume mesh generators for pure tetra and hexa-dominant mesh
- High accuracy during boundary recognition of the structural wetted surface
- Interactive recognition of intermediate steps regarding opening recognition



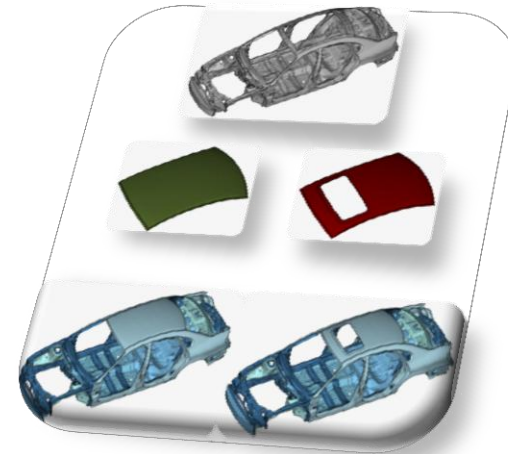
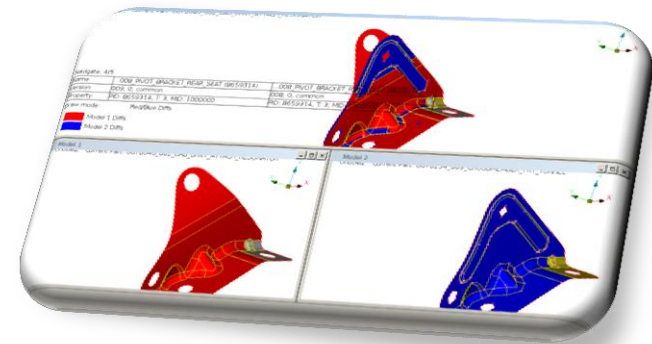
## HEXABLOCK enhancements

- Menu re-organization
- Functions for box creation and meshing of surface and volume mesh with different algorithms (MAP QUAD, FREE etc)
- Support of degenerate Boxes



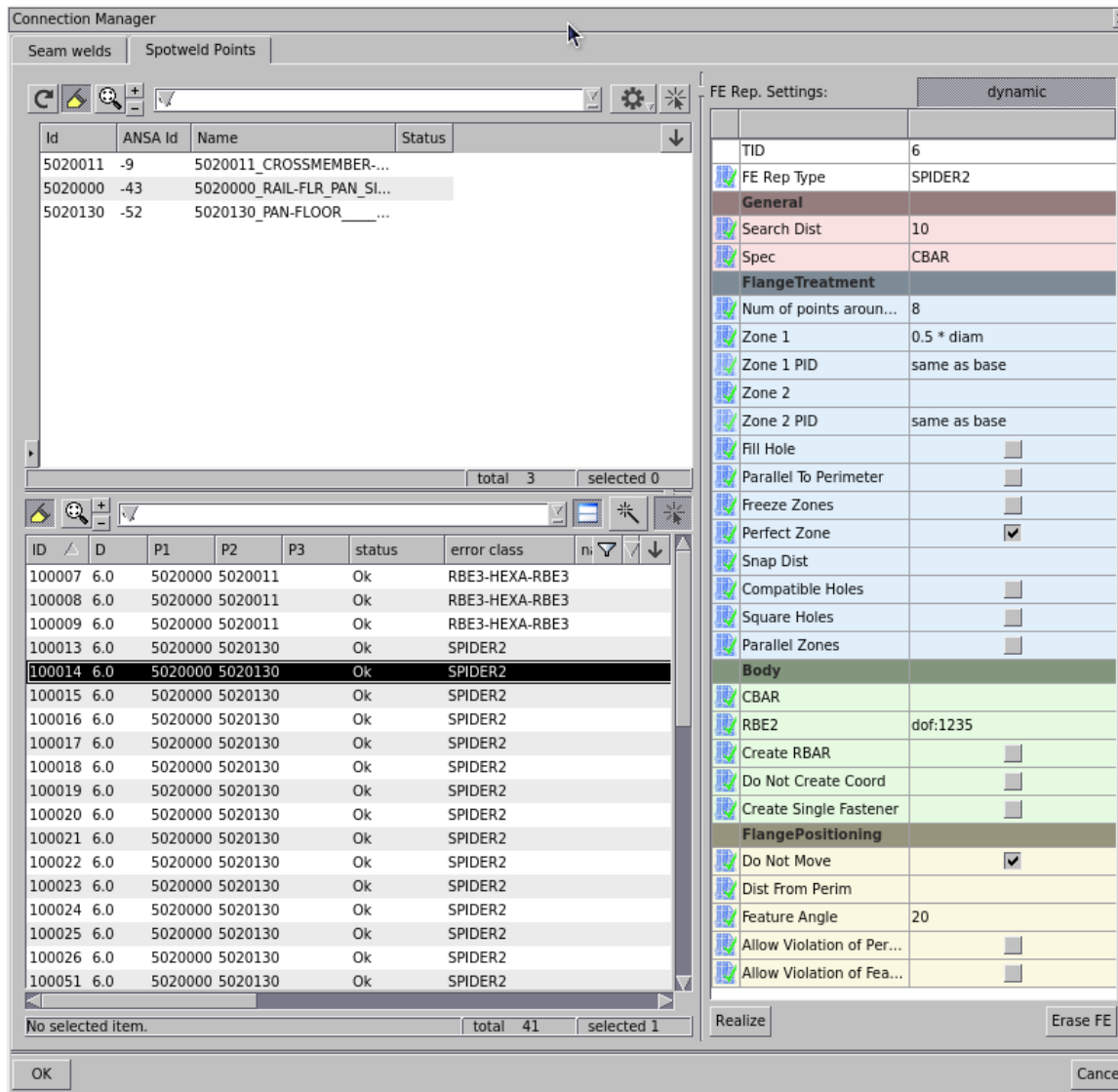
# Model Management

- Connections management
- Model Comparison
- Variants Configuration
- Connectivity – Similarity detection
- ANSA DM - Interface with SPDRM





# Assembly - New Connection Manager



**Connection Manager**

Seam welds | Spotweld Points

Id	ANSA Id	Name	Status
5020011	-9	5020011_CROSSMEMBER...	
5020000	-43	5020000_RAIL-FLR_PAN_SI...	
5020130	-52	5020130_PAN-FLOOR_...	

total 3 selected 0

ID	D	P1	P2	P3	status	error class	n
100007	6.0	5020000	5020011		Ok	RBE3-HEXA-RBE3	
100008	6.0	5020000	5020011		Ok	RBE3-HEXA-RBE3	
100009	6.0	5020000	5020011		Ok	RBE3-HEXA-RBE3	
100013	6.0	5020000	5020130		Ok	SPIDER2	
100014	6.0	5020000	5020130		Ok	SPIDER2	
100015	6.0	5020000	5020130		Ok	SPIDER2	
100016	6.0	5020000	5020130		Ok	SPIDER2	
100017	6.0	5020000	5020130		Ok	SPIDER2	
100018	6.0	5020000	5020130		Ok	SPIDER2	
100019	6.0	5020000	5020130		Ok	SPIDER2	
100020	6.0	5020000	5020130		Ok	SPIDER2	
100021	6.0	5020000	5020130		Ok	SPIDER2	
100022	6.0	5020000	5020130		Ok	SPIDER2	
100023	6.0	5020000	5020130		Ok	SPIDER2	
100024	6.0	5020000	5020130		Ok	SPIDER2	
100025	6.0	5020000	5020130		Ok	SPIDER2	
100026	6.0	5020000	5020130		Ok	SPIDER2	
100051	6.0	5020000	5020130		Ok	SPIDER2	

No selected item. total 41 selected 1

**FE Rep. Settings:** dynamic

TID	6
FE Rep Type	SPIDER2
<b>General</b>	
Search Dist	10
Spec	CBAR
<b>FlangeTreatment</b>	
Num of points aroun...	8
Zone 1	0.5 * diam
Zone 1 PID	same as base
Zone 2	
Zone 2 PID	same as base
Fill Hole	<input type="checkbox"/>
Parallel To Perimeter	<input type="checkbox"/>
Freeze Zones	<input type="checkbox"/>
Perfect Zone	<input checked="" type="checkbox"/>
Snap Dist	
Compatible Holes	<input type="checkbox"/>
Square Holes	<input type="checkbox"/>
Parallel Zones	<input type="checkbox"/>
<b>Body</b>	
CBAR	
RBE2	dof:1235
Create RBAR	<input type="checkbox"/>
Do Not Create Coord	<input type="checkbox"/>
Create Single Fastener	<input type="checkbox"/>
<b>FlangePositioning</b>	
Do Not Move	<input checked="" type="checkbox"/>
Dist From Perim	
Feature Angle	20
Allow Violation of Per...	<input type="checkbox"/>
Allow Violation of Fea...	<input type="checkbox"/>

Realize Erase FE

OK Cancel

## General

- Always open
- Standard list functionality

## Parts section

- “Identify” functionality

## Connections section

- Easy filtering

## FE representation section

- Rational grouping of settings
- Direct preview of FE-rep settings of selected
- Indication of setting compliance with template

## Connection templates

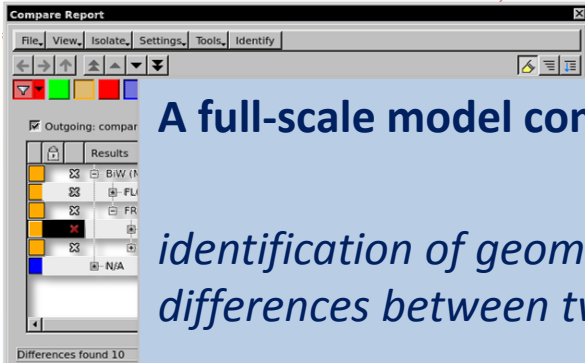
- Definition of mandatory and insignificant settings

# Models Comparison

## Interface

## Smart Navigation

## Matching

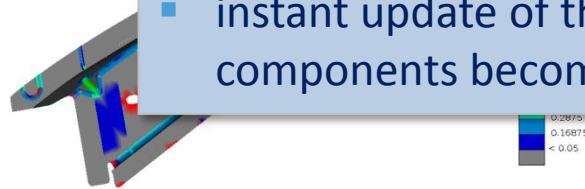


**A full-scale model comparison tool.**

*identification of geometrical, weld information and solver keywords differences between two models*

**significantly speeds-up the model pre-processing time**

- re-use of existing meshes from previous model versions
- mapping of laminate information from one model to another
- instant update of the an assembly when the new versions of several components become available



Model 1	Model 2	Unmatched
Optimized Points	2011	4
Optimized Lines	20	0
Adhesive Lines	20	0
Mesh Lines	107	0
Balls		
Adhesive Faces		
Quadrings		
Homologous		

Model 1	Model 2	Unmatched
Name	BEAM FRONT_TENDR_SIDE_SHELL L1	4800T1
Material ID		
Version		
ReparamMeth	4800T1	
ppf	1.5	
Thickness	STEEL	
Material Name		34.85%
Cost difference		40.15%
% Cost Diff	34.85%	
% Weight Ratio	40.15%	

- Geometry matching between solid description and mid-surface
- New, enhanced PPTX report

## Models Comparison

Interface

Smart Navigation

Matching

Geometric differences

Reporting

### **A full-scale model comparison tool.**

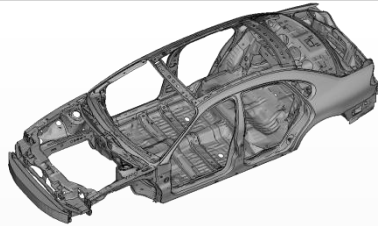
*identification of geometrical, weld information and solver keywords  
differences between two models*

### **significantly speeds-up the model pre-processing time**

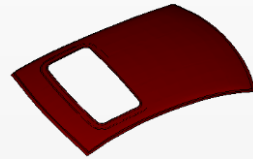
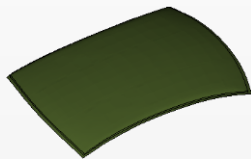
- re-use of existing meshes from previous model versions
- mapping of laminate information from one model to another
- instant update of the an assembly when the new versions of several components become available

# Model Variants Management

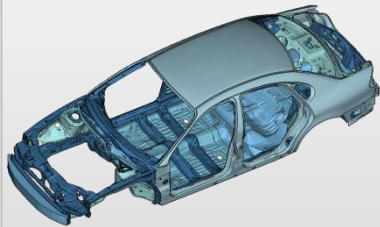
## Configurations



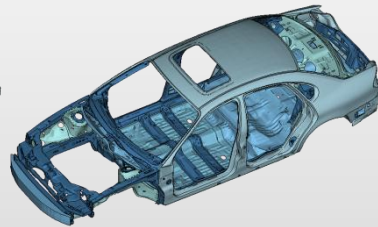
Common parts



Mutually exclusive parts



Body\_Normal\_Roof



Body\_Sun\_Roof

Configurations Table (1)

New View Utilities DM Set Part Identify

Name	Body_Normal_Roof	Body_Sun
<input type="checkbox"/> B PILLAR LEFT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> B PILLAR RIGHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> C PILLAR LEFT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> C PILLAR RIGHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> FIREWALL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> FLOOR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> FRONT BUMPER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> LIGHT MOUNTS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> MOUNTS & BRACKETS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> RAIL FRONT LEFT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> RAIL FRONT RIGHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> RAIL REAR LEFT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> RAIL REAR RIGHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> REAR BUMPER FRAME	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> REAR SEAT SUPPORT MOUNT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> ROCKER PANEL LEFT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> ROCKER PANEL RIGHT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> ROOF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> ROOF_PARTS	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> SUNROOF	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> NORMAL_ROOF	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> ROOF_REINFORCEMENT-L1	<input type="checkbox"/>	<input checked="" type="checkbox"/>

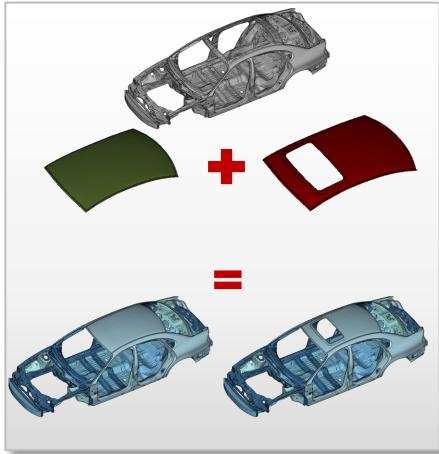
Groups:33 Parts:173 total 206 selected 1

Name	Value
<input type="checkbox"/> Position	
<input type="checkbox"/> Misc	
<input type="checkbox"/> Configurations	
<input type="checkbox"/> Body_Normal_Roof	✘
<input checked="" type="checkbox"/> Body_Sunroof	✔
<input type="checkbox"/> User Attributes	
CONF_STATUS	
Owner	
USER_1	
USER_2	

Comment

# Model Variants Management

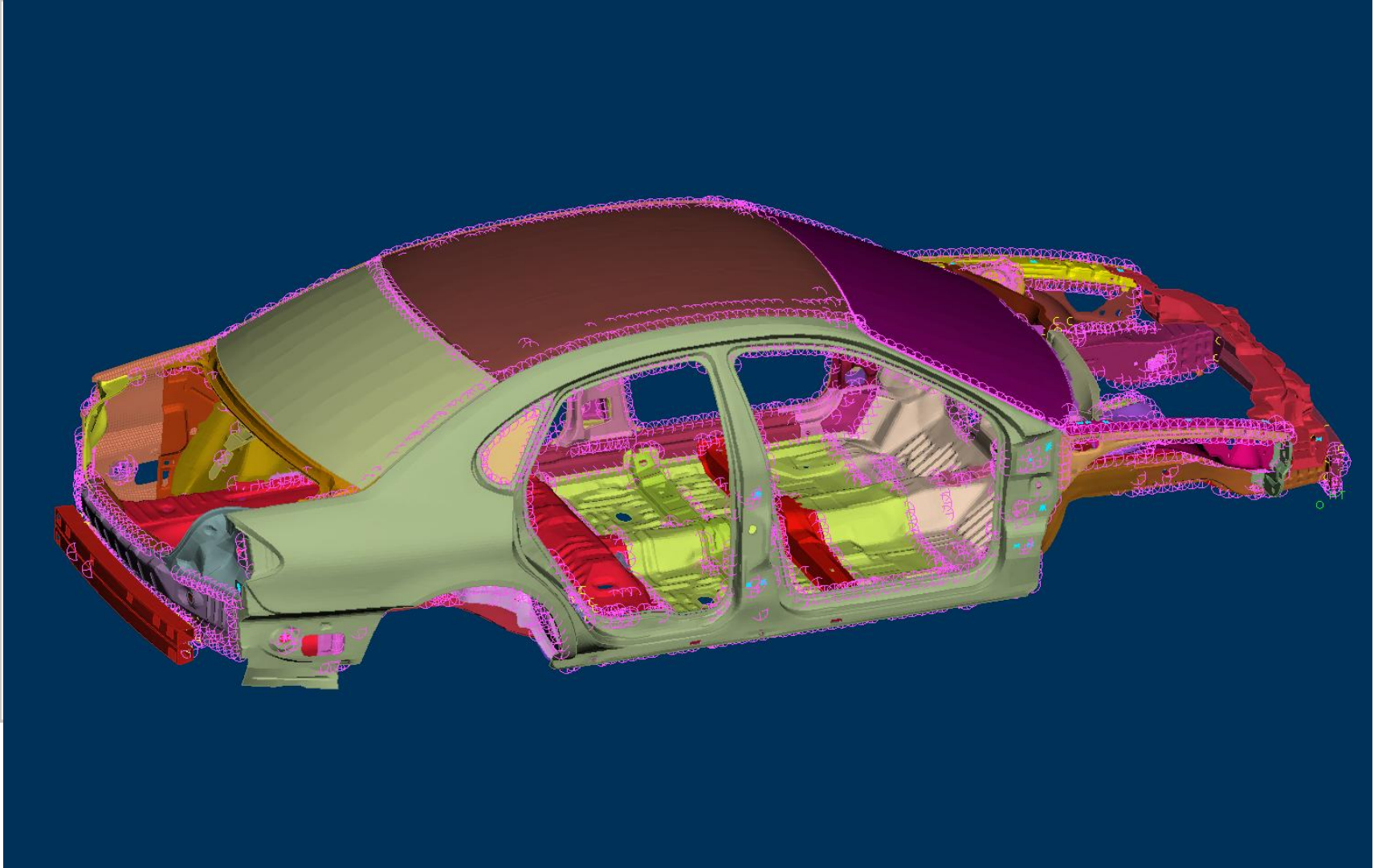
## Configurations



- One ANSA file with all possible variants
- Simple procedure for model variants creation
- Centralized creation, maintenance and update of several model variants
- Great time and effort savings



# Variants Configuration



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# Variants Configuration

Part Manager


New View Utilities DM Configurations Set Part Identify

Name Module Id Name

- config\_normal\_roof\_loi BIW\_100000 BIW\_NORMAL\_ROOF
- config\_sun\_roof\_long Mutually\_exclusive\_roof
- config\_normal\_roof\_sh Mutually\_exclusive\_side
- config\_sun\_roof\_short Rear
- 205000 WINDOWS

Groups:41 Parts:308 (L:136) total 349 selected 1

Name	Value
Module Id	
Name	Mutually_exclusive_roof
Version	
Representation	
Study Version	0
<b>General</b>	
Id	187
Hierarchy	
Mesh Parameter ...	
Save Representati...	



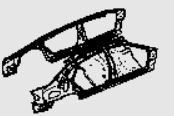
Configurations Table (1)

New View Utilities DM Set Part Identify

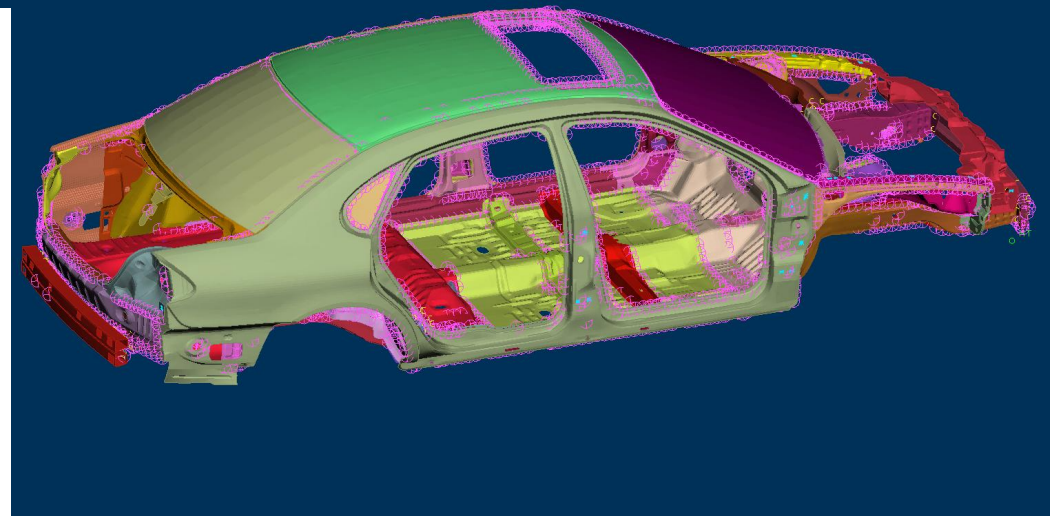
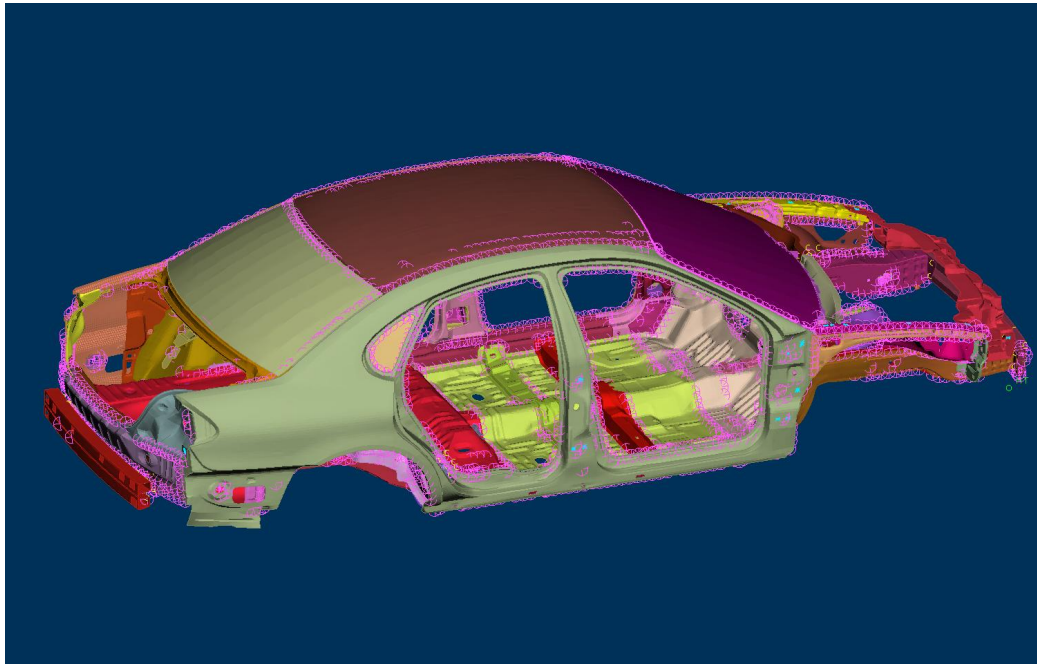
Name	config_normal_roof_long	config_normal_roof_short	config_sun_roof_long	config_sun_roof_short
BIW_NORMAL_ROOF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mutually_exclusive_roof	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
normal_roof_long	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
normal_roof_short	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
sun_roof_long	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
sun_roof_short	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mutually_exclusive_side	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
side_long	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
side_short	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Rear	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WINDOWS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Groups:41 Parts:308 (L:136) total 349 selected 1

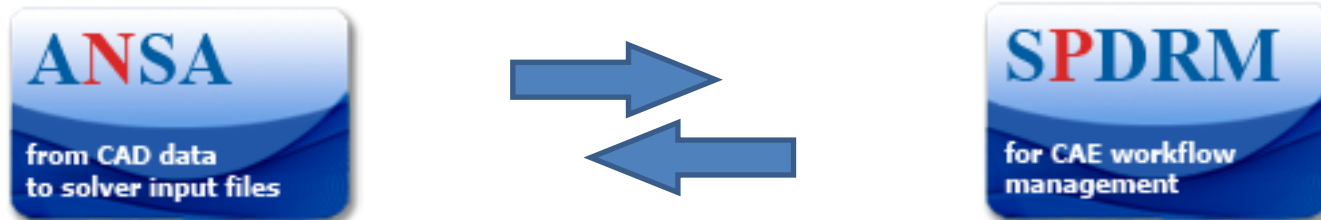
Name	Value
Module Id	
Name	side_long
Version	
Representation	
Study Version	0
<b>General</b>	
Id	87
Hierarchy	Mutually_exclusive_side/
Mesh Parameter Name	
Save Representati...	



# Variants Configuration



## Use of the SPDRM as a data vault by ANSA



**ANSA Data Management pool acquires the standard features of a database**

**ANSA can directly store and retrieve files from the SPDRM database**

- Library files, part, group, include representations, connection files ... ..

✓Configurable and controllable data access

✓Secure data and processes

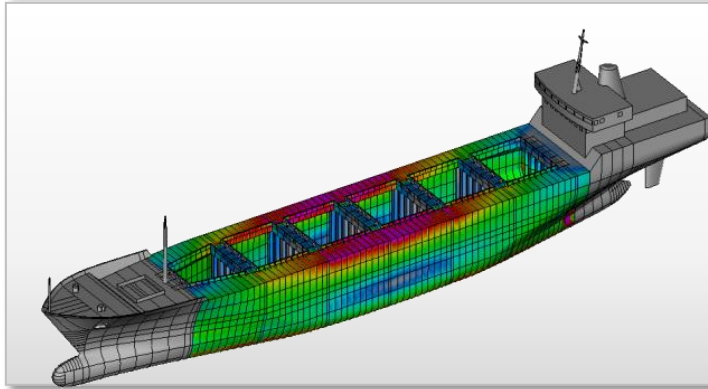
✓Data recovery

✓Connectivity (external access) is facilitated

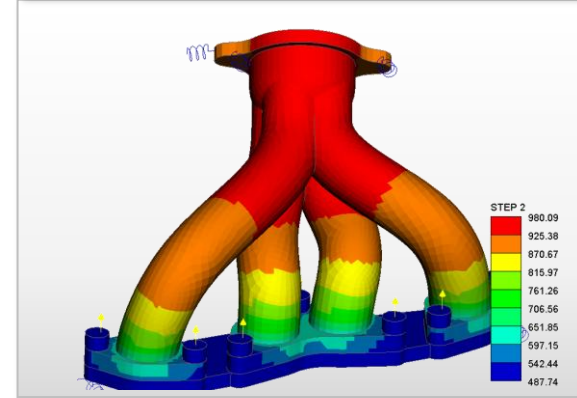
**The database is handled in a centralized manner at an Enterprise level**

# Pre - Processing Interfaces

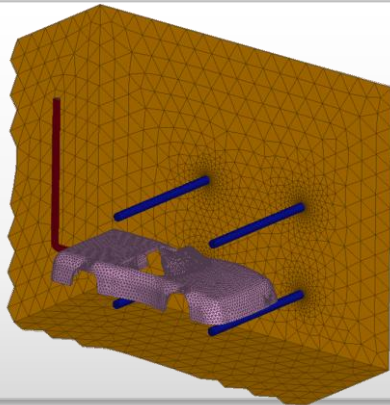
**SESTRA**



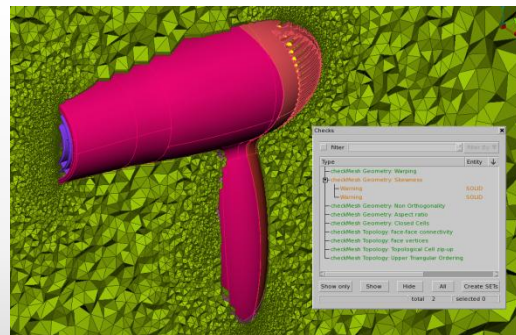
**THESEUS - FE**



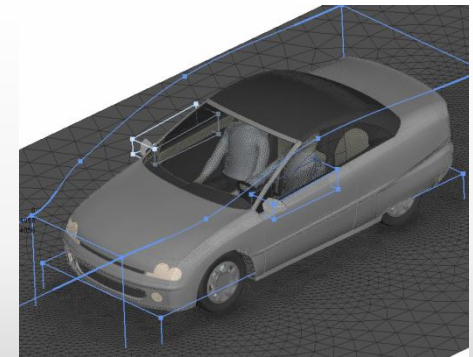
**MOLDEX 3D**



**OpenFOAM**



**SC/Tetra**





# Pre - Processing Enhancements

## NASTRAN

- SOL 400 - SOL 600
- Super elements / sub-structuring support
- Bolts pre-tension
- New Case Control Management (Header) interface

## ABAQUS

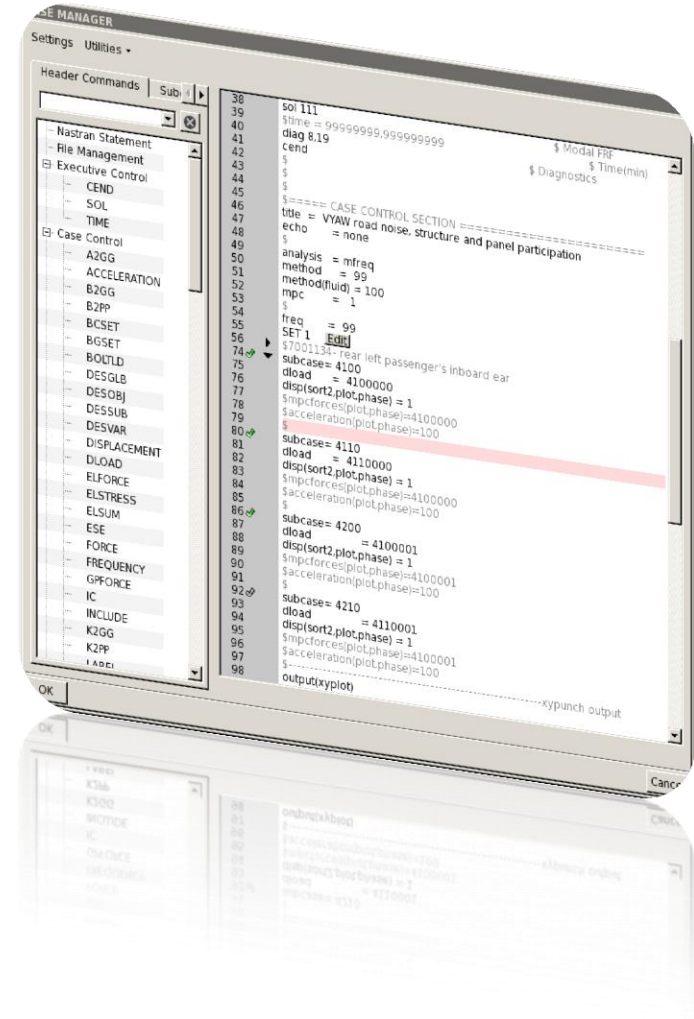
- Co-Simulation

## LS-DYNA

- ALE keywords

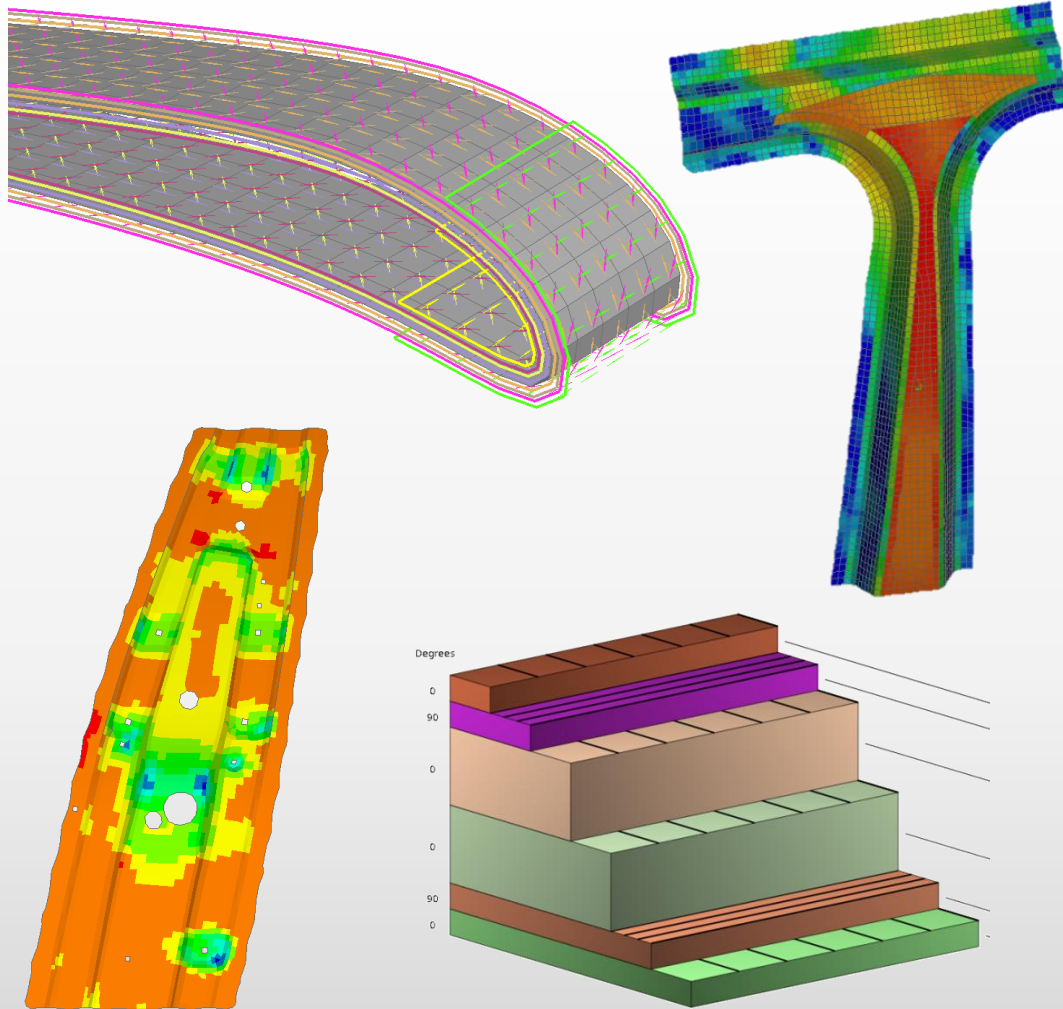
## LS-DYNA, ABAQUS, PAM-CRASH

- \*PARAMETER, VARDEF\_/ keywords



# Analysis Tools

## Laminate - Results Mapping



### Composites

- Redistribution / redefinition wizard for layers
- Generation of output request
- ELEMENT\_SHELL\_COMPOSITE
- Composites for TShell

### Results Mapping

- PAMSTAMP Laminate
- Integrated in Compare
- Automation via scripting

## Analysis Tools - Kinetics Module

### Multibody Dynamics “in-house solver” embedded in ANSA

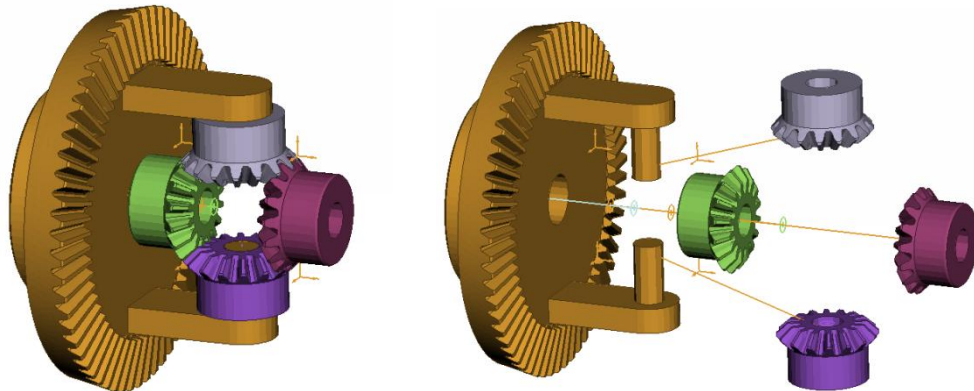
- Positioning of mechanisms
  - No need to create a kinematic configuration
  - Easy to set up and use
- Run Multibody dynamic simulations
  - Support of contacts
  - non-smooth dynamic approach for contacts
- Run Multibody simulations providing results as input for another analysis
  - reduce drastically the total simulation time

### Loads

- Force / time
- Force / displacement
- Damp / Bush entities
- Prescribed Motion

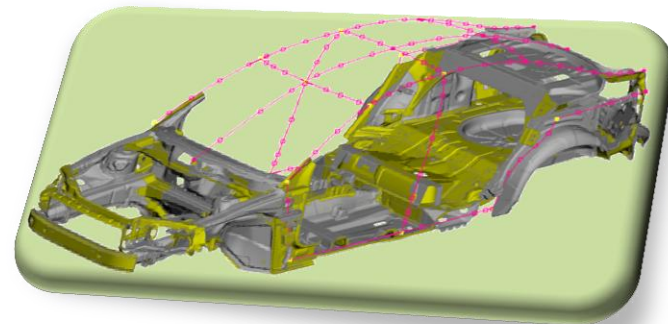
### Results

- Reaction force / moment
- Velocity / acceleration
- Displacements
- Plot of measurement
- Export of results



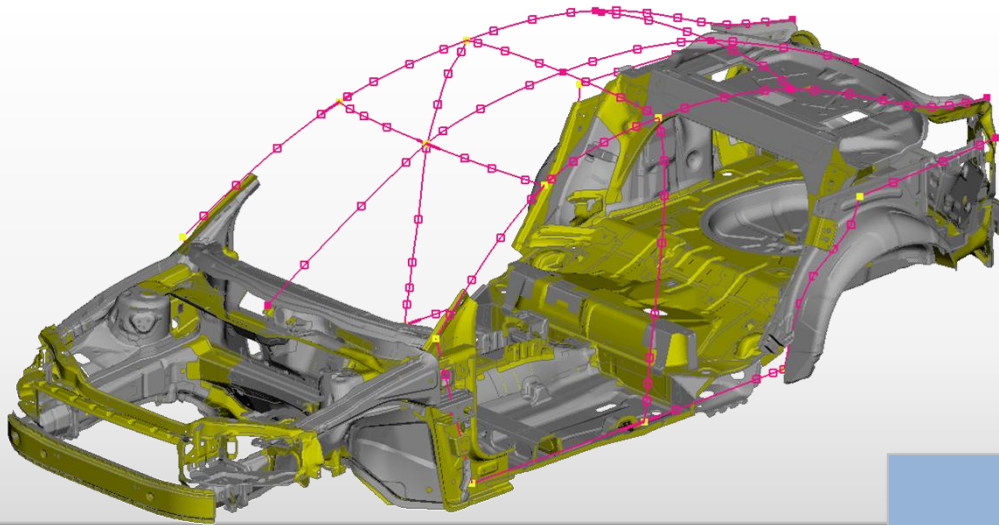
## Morphing & Optimization

- **New Morphing entities**
- **New Morphing “boxes” shape**
  - Easier definition and handling
- **Direct “boxless” morphing**
  - Easier and more flexible application
- **DOE optimization interface**

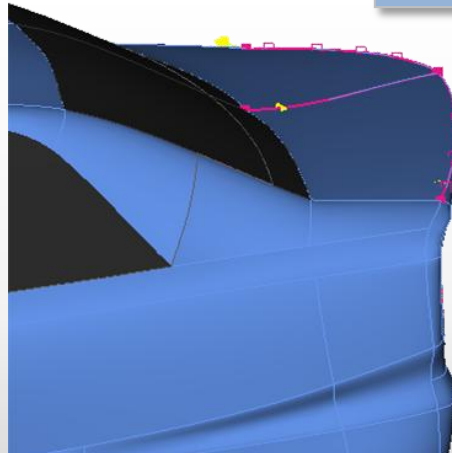
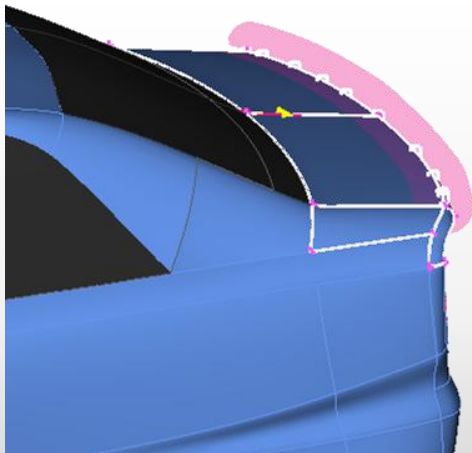


# Morphing

## 1-D MORPH



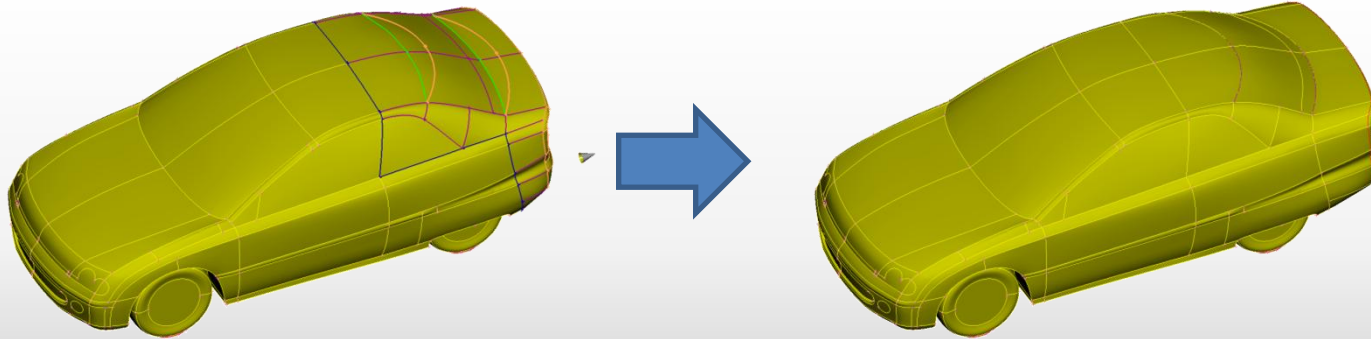
**Easier definition and handling**  
**Easier and more flexible application**



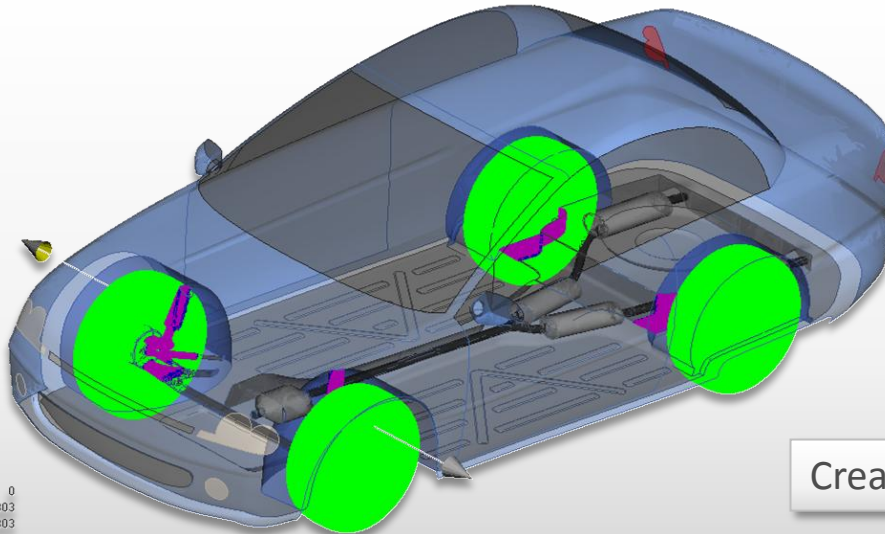


# Morphing

## Direct - "boxless" - morphing



## DFM

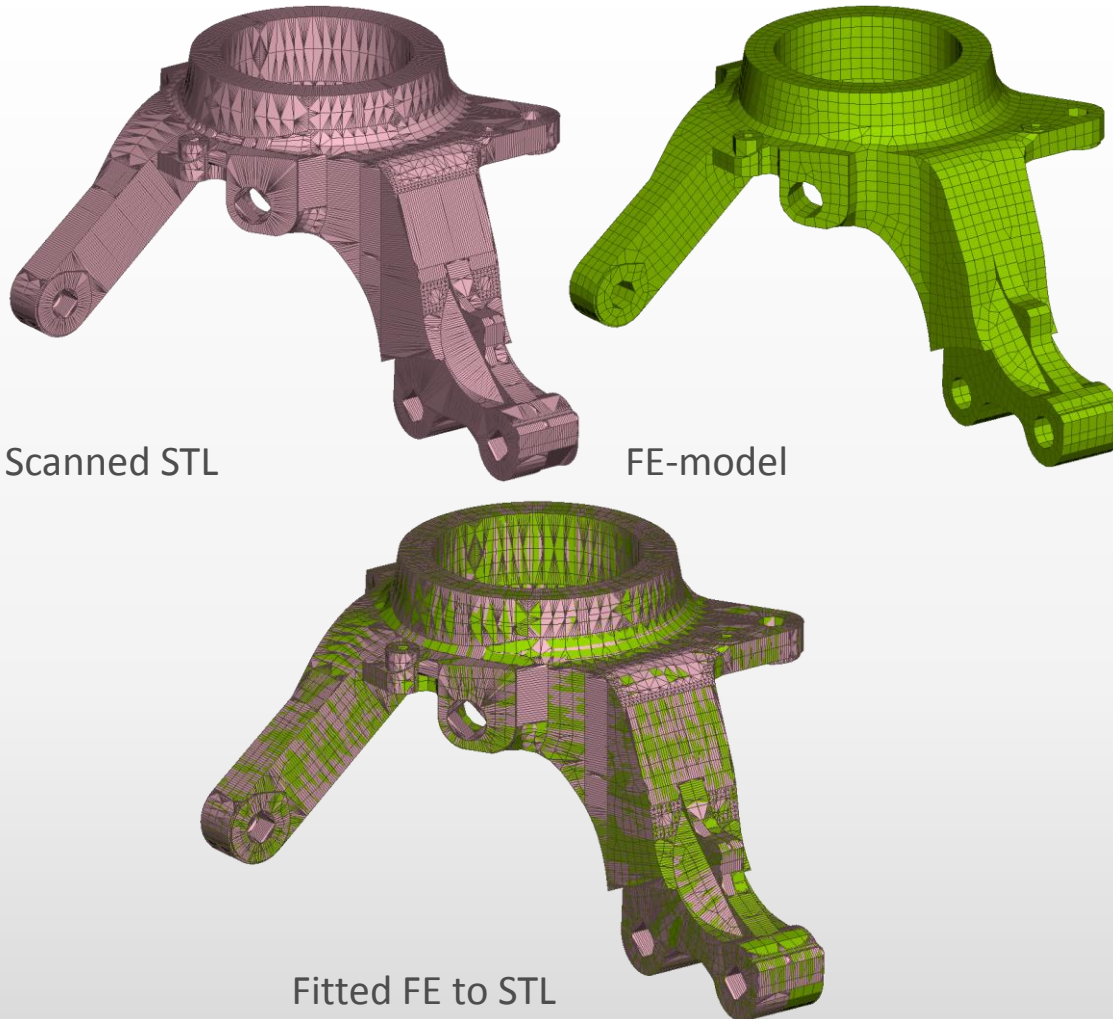


GPU technology  
Increased speed and usability  
Increased accuracy

Creation of surface fitting parameters

# Morphing

## Nominal to Real



### Nominal to Real

- Fit and match FE-model to scanned (STL) prototype
- Create a CAE model exactly the same to the manufactured one

# Optimization

**DOE Study Report**

Experiments Directory: /mnt/raid\_disk/DATA/run/test1/

DV File: rib.txt

Response File: response.txt

List filter: [icon]

height	width	angle	Response1
46.8500633	-20.	-20.	-20.
60.5763359	-20.	-20.	20.
1	-20.	35.	-20.
1	-20.	35.	20.
230.877762	20.	-20.	-20.
304.390442	20.	-20.	20.
1	20.	35.	-20.
1	20.	35.	20.

Read Save Clear list Cancel

## DOE Study

- New set up interface
- Solver initiation
- $\mu$ ETA initiation
- New Study report functionality (Design table)

## Optimization Report

- Information, warnings, errors

**Optimization report**

Report options for 'OPTIMIZATION\_TASK\_1'

Append or overwrite report file: Append

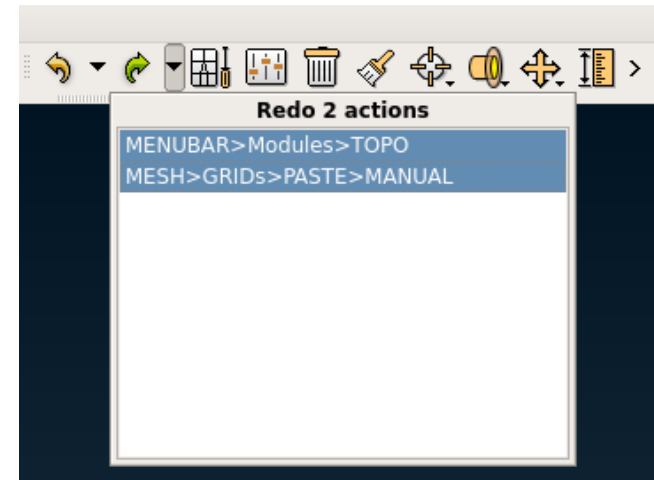
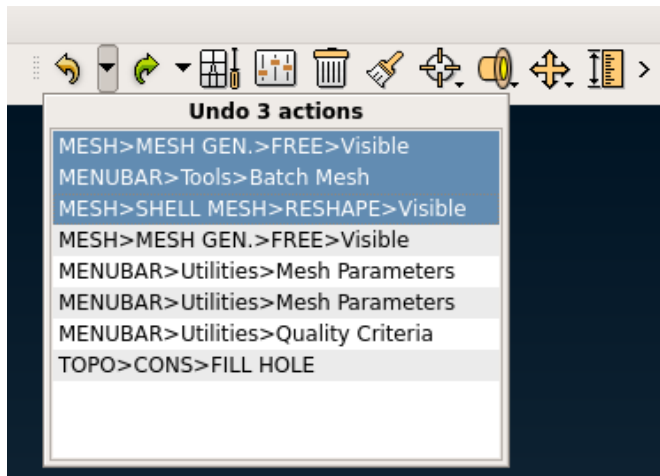
Name	Handling	Comment
Freeze check	Warning	
Geometry check	Fatal	
Overlapping boxes	Fatal	

User scripts **error return** value handling

Script name	Script function	Handling	Comment
reconstruct	reconstruct ( )	Warning	reconstruct failed
User Scripts->mass	main ( )	Warning	no mass exported

OK Cancel

# ANSA v.14.2.0 : User interface



# Thank you

## Stay connected

website

[www.beta-cae.gr](http://www.beta-cae.gr)

support

[ansa@beta-cae.gr](mailto:ansa@beta-cae.gr)

social media





# ANSA

## Latest Developments



5-7 June 2013  
THE MET HOTEL  
Thessaloniki, Greece