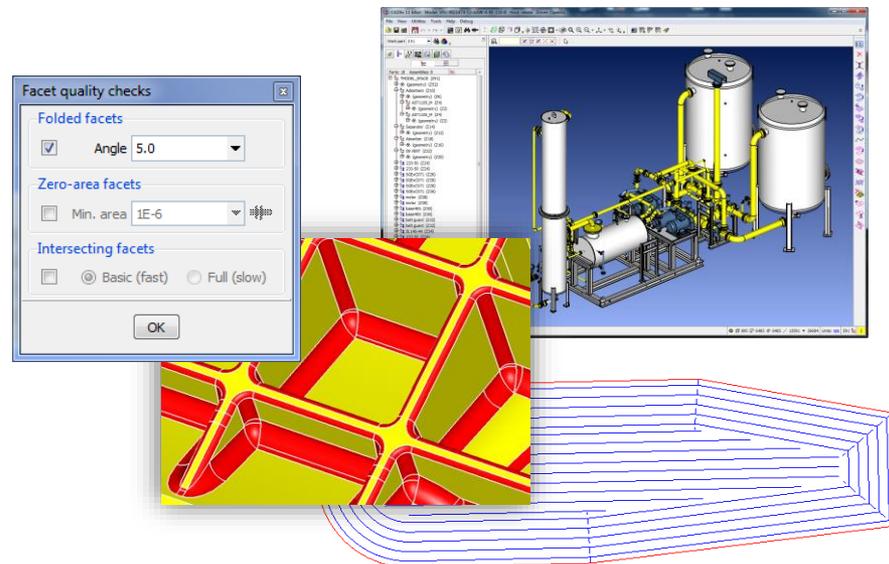# CADfix DX 12 - Summary

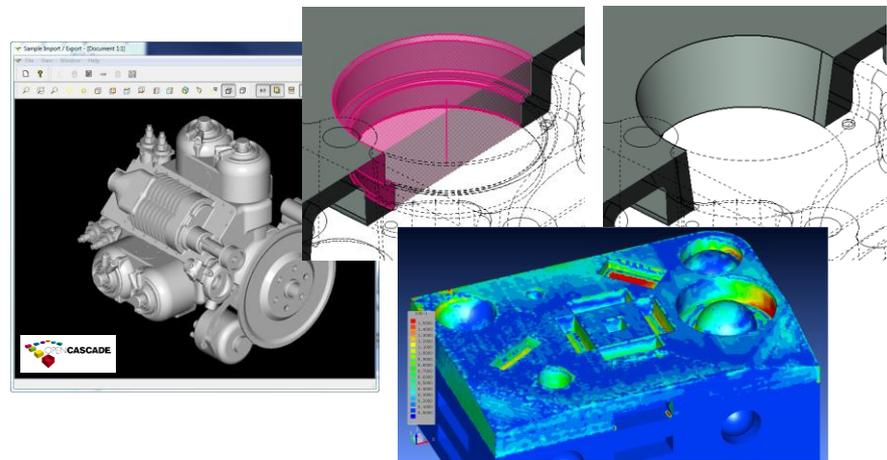**July 2018**

CADfix 12 – DX Summary

- Import/Export
  - CAD version updates
  - New XGL/ZGL and FBX exports
  - More robust STL export
- Assemblies
  - Faster screen selection and tree updating
- Wizard
  - Macro scripting support expanded
- Diff3D - New module for:
  - CAD-to-CAD merging
  - Mesh-to-CAD compare
  - Scan-to-CAD compare
- Morph
  - Improved matching
  - Improved deformations
  - New support for virtual topology

- Facets
  - Major advance in large zone parameterisation
- Diagnostics
  - New "inconsistent loop" test
- Defeature
  - Faceted primitive body to solid body
  - Primitive body to centreline
- Split
  - New split face in to quads tool (proto)
  - New hex-skin subdivision tool (proto)
- GUI
  - New macro record and playback
  - New vertical tab layout
  - Large expansion of the cwi api
  - Various user driven improvements
- Misc.
  - 3-5x performance boost compared to CADfix 11 across most operations

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Rollup of CADfix 11 Service Packs

- **11/SP1** (Mar 2017)
  - DXF/DWG assembly support
  - New STL quality checks
  - Improved fillet removal
  - New 3D printing toolpaths
  - New multi-face smart selection

- **11/SP2** (Sep 2017)
  - New export to OpenCASCADE
  - Improved JT import
  - New hole simplification tool
  - Faster matching for Morph
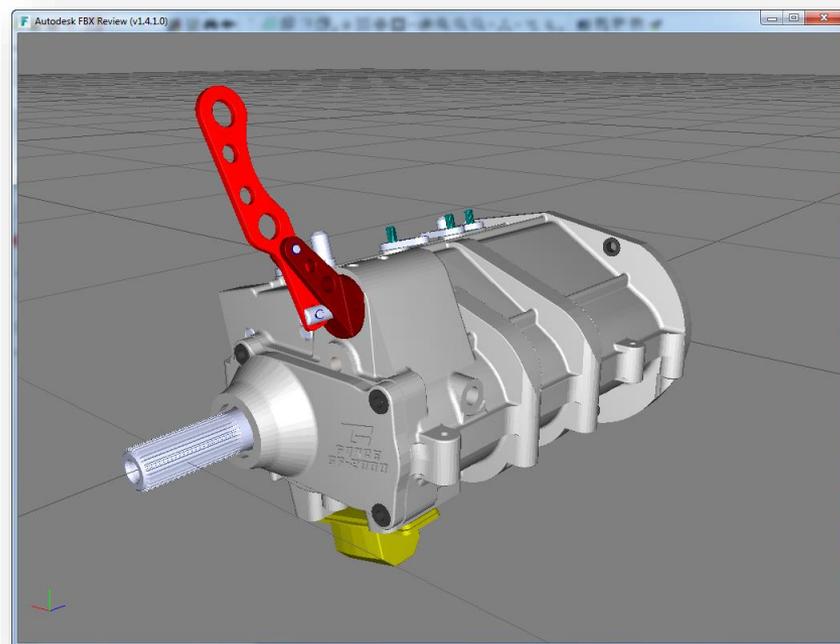 - Point cloud to CAD compare

Import/Export

- CAD version support updates
  - CATIA V5 2018
  - NX12
  - SolidWorks 2018
  - Creo 5.0
  - JT v9.0
  - Inventor import now available on Linux
- STEP export
  - Support for tessellated surfaces
- DXF/DWG export
  - Support for exporting assemblies as facets

- New XGL/ZGL export
- New FBX export
- OBJ export
  - New support for colours (.mtl file) and transparency
- Transparency support
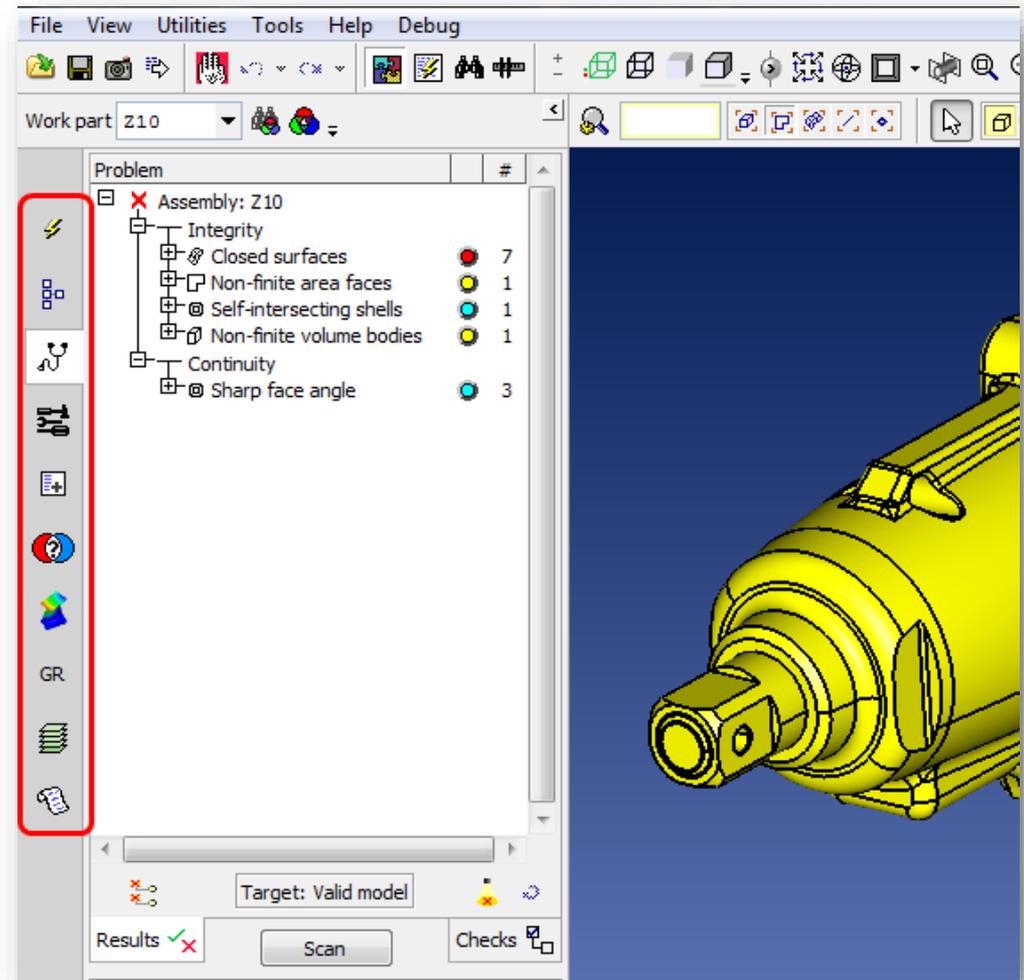 - Support for import and export of transparency properties from most CAD systems

New FBX Export

- Common file format used by AR/VR applications
- FBX export in CADfix 12 provides:
  - Export of assembly models (significantly reduces file size)
  - Export of colours and transparency from original CAD system
  - Export of quality vertex normals for smooth shading
  - Level of detail controls
- When used with CADfix auto-simplification, such as hole removal, enables generation of compact FBX models from complex highly detailed CAD models
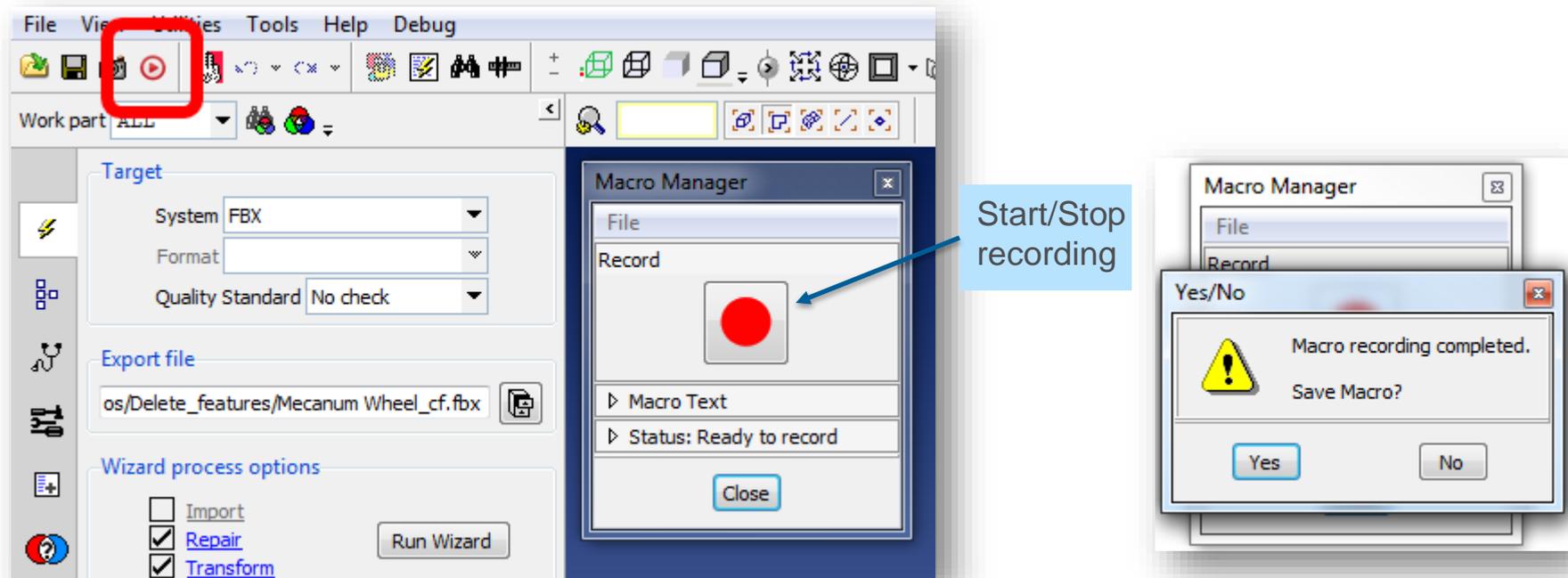
New GUI layout

- High-level vertical tabs
- Cleaner navigation
- Seperates top-level functionality groups
  - Wizard, Model tree, Diagnostics, Tools, App Data, Diff(new), Morph, GR, AM, and Status
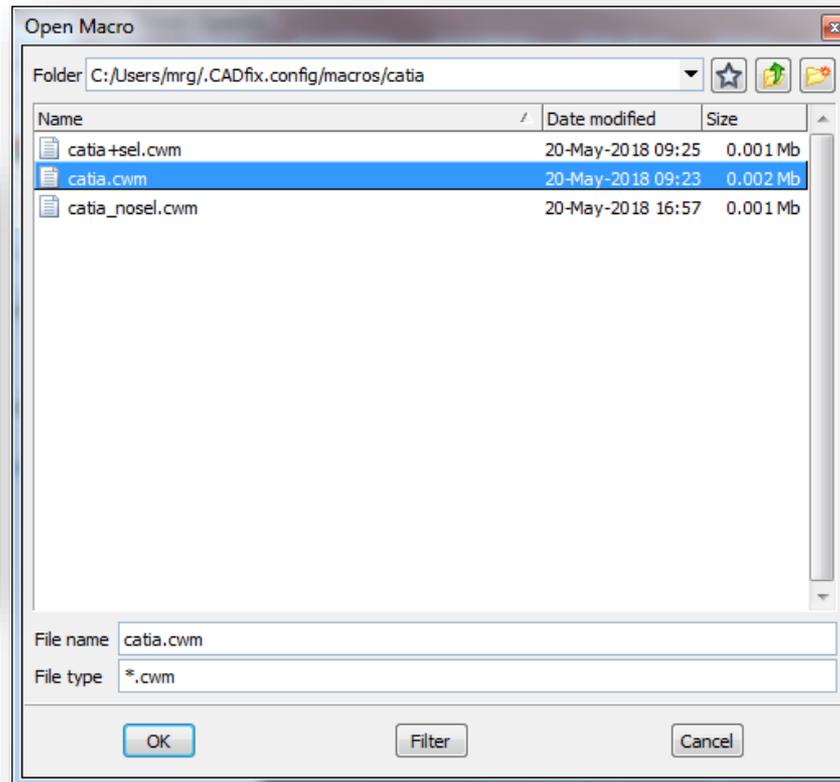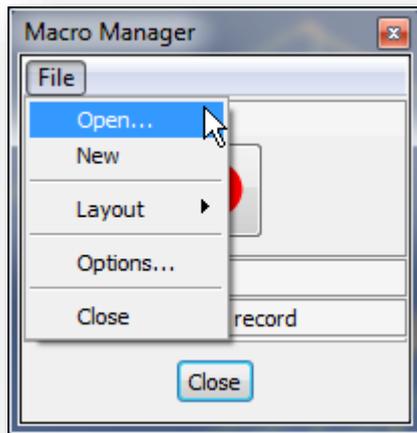
Macro Record/Playback - Basic

- Record interactive operations
  - Capture and playback of interactive workflows
  - Most interactive and Wizard functions can be recorded
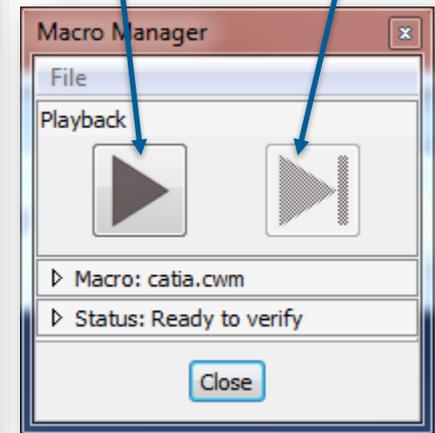 - Macros saved in .cwm file

Start/Stop recording

Macro Record/Playback - Basic

- ## Playback
  - Load external macro and re-play
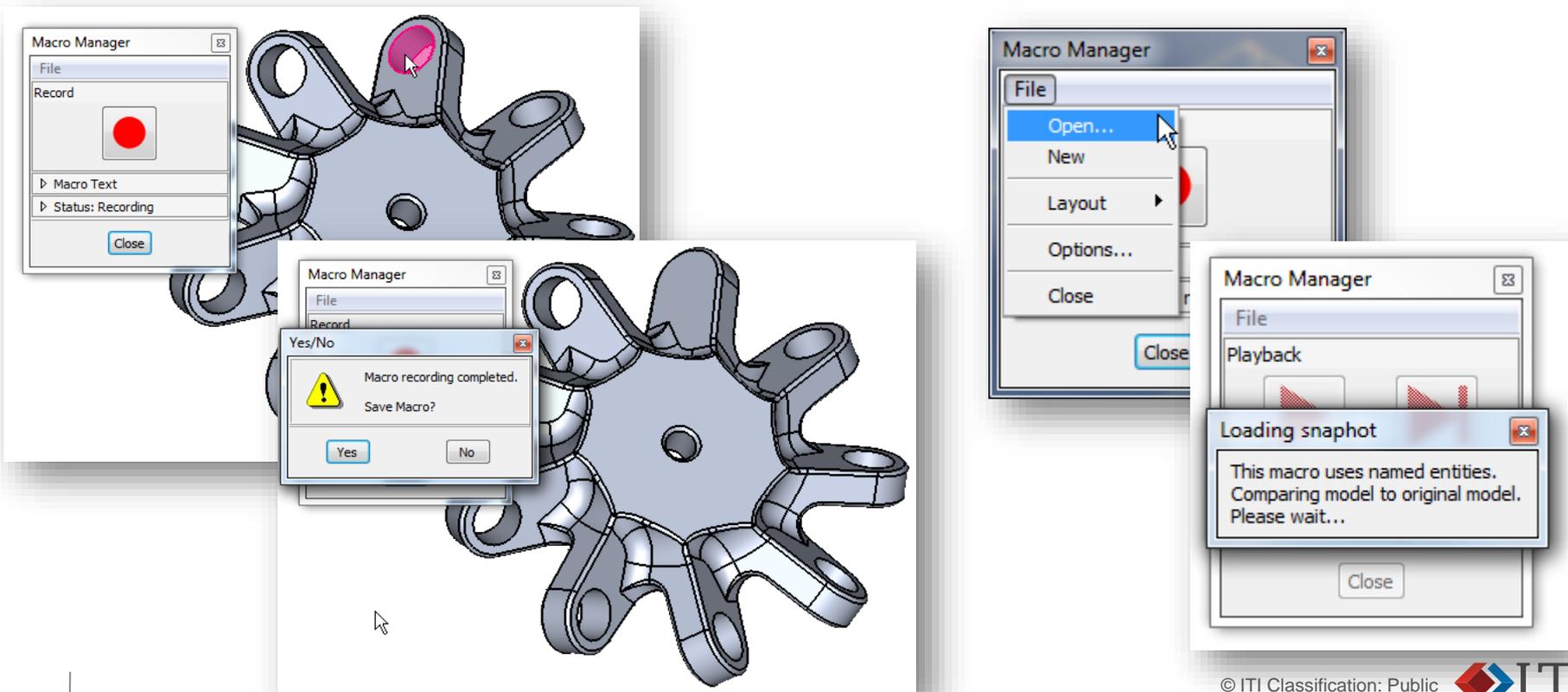 - Play whole macro or execute step-by-step

Play whole macro

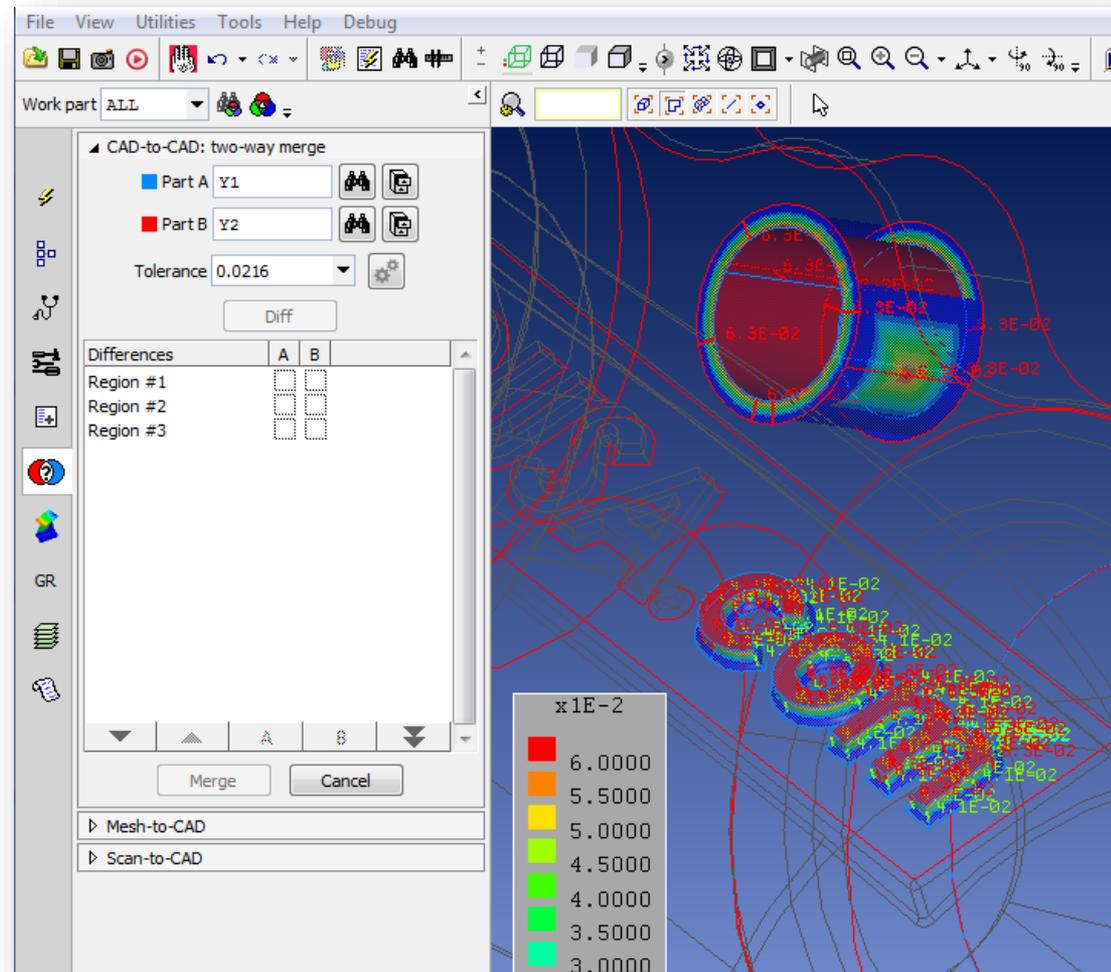Play step by step

Macro Record/Playback - Advanced

- Record operations on selected entities
  - Names of selected entities recorded in macro
  - Playback on a **different** model with different entity names
  - Automatic model **comparison** performed to map entity names
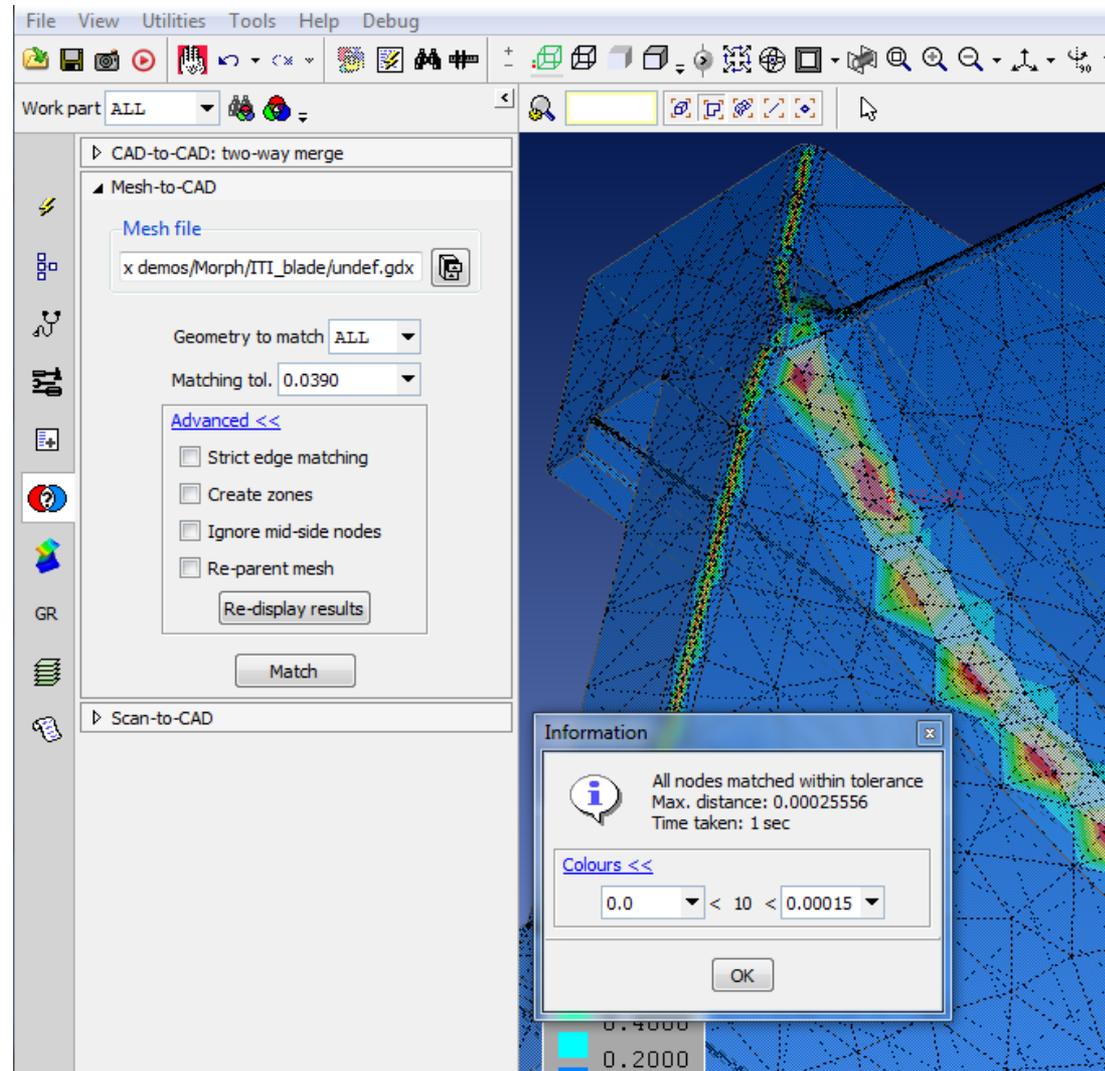
New "Diff3D" Tools

- ## CAD-to-CAD diff and merge
  - Identify regions of difference between 2 models, e.g.
    - Different revisions of same CAD model
    - Before/after versions of the same model
  - Visual feedback showing differences between regions
  - Selectively **merge** differences to form a new model

New "Diff3D" Tool

- ## Mesh-to-CAD diff
  - Import mesh (solid or surface)
  - Match to CAD
  - Option to ignore mid-side nodes
  - Reports max. differences
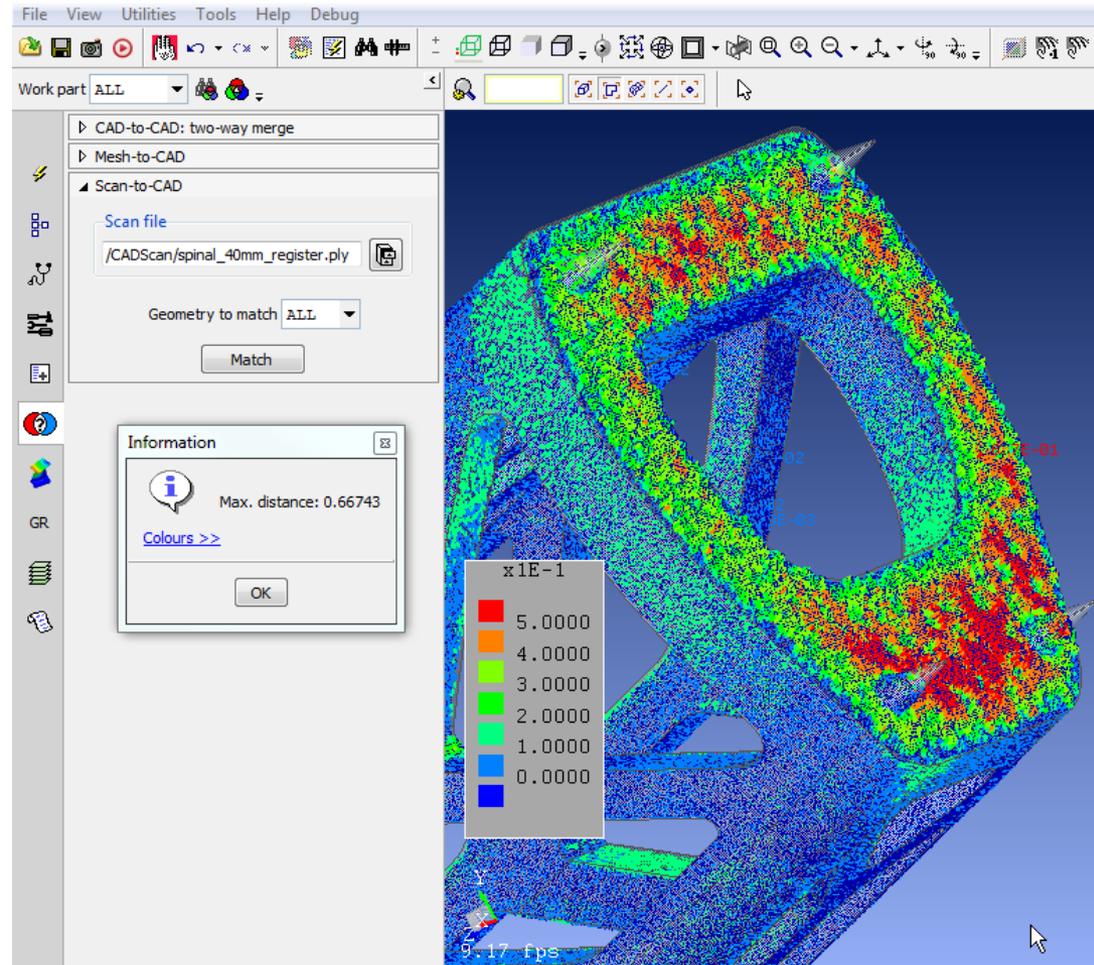 - Supports virtual topology (mesh that doesn't align with CAD edges)

New "Diff3D" Tool

- Scan-to-CAD diff
  - Point cloud and facet imports supported:

  - Compute distances to CAD geometry
  - Future developments:
    - Alignment/registration tools
    - Report generation
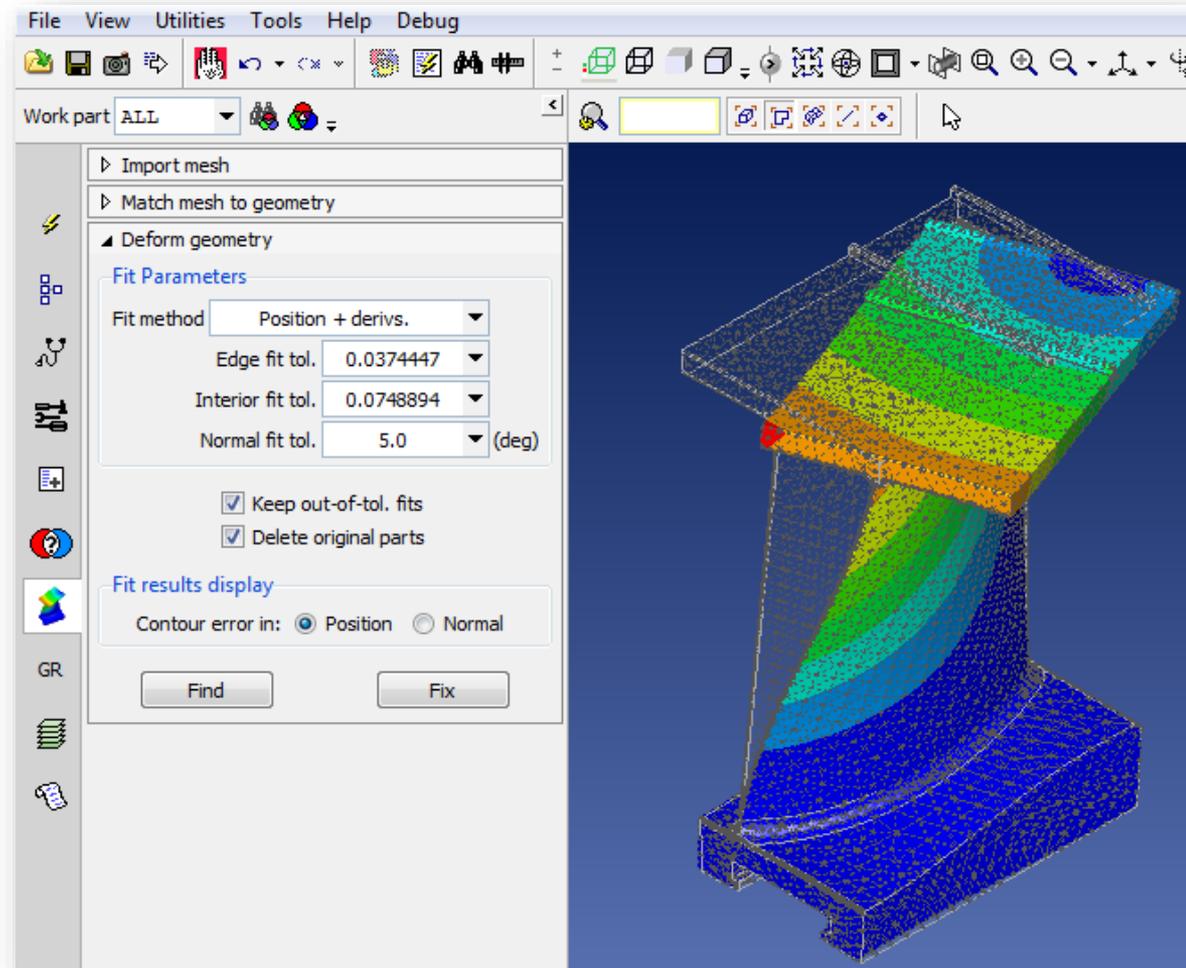
Morph

- New high-level morph tool
  - 3 steps:
    - Import
    - Match
    - Deform
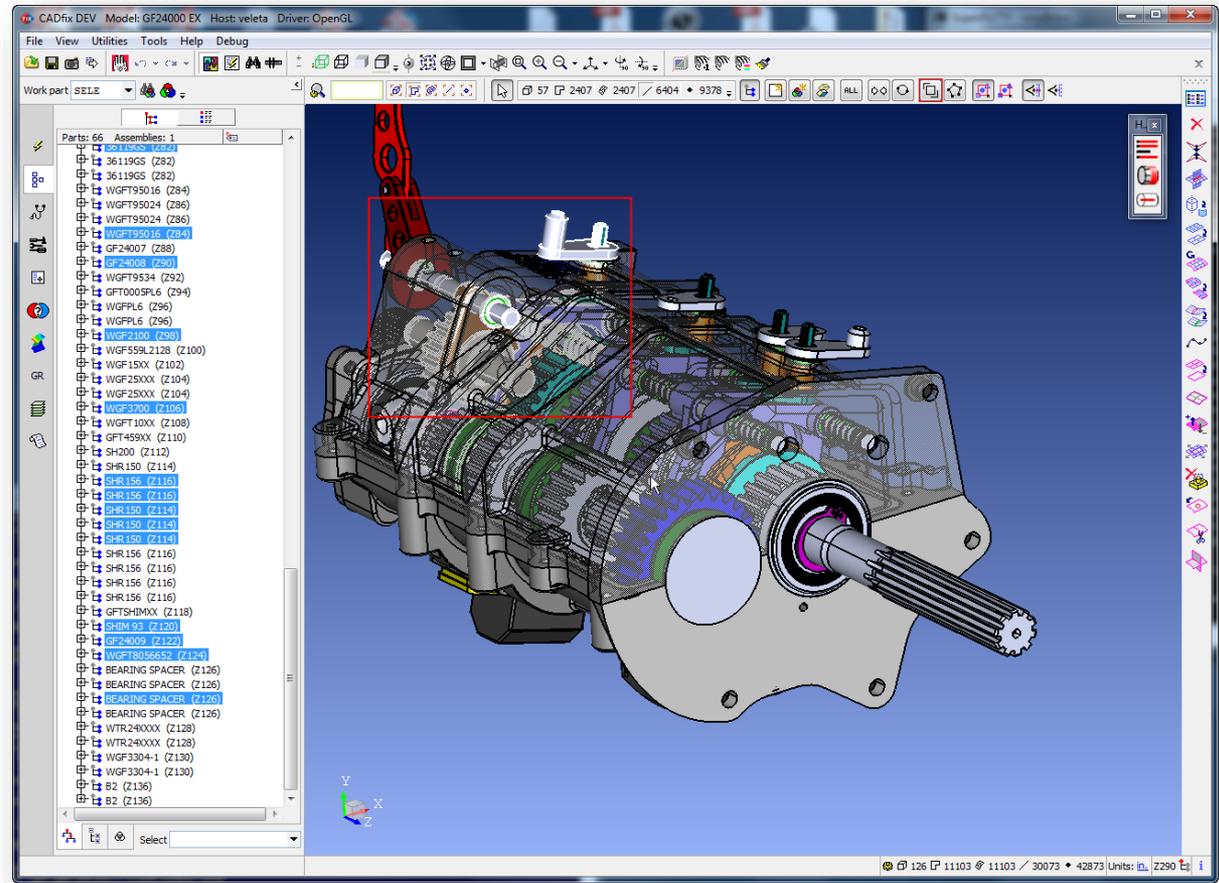 - Import supports surface and solid meshes:

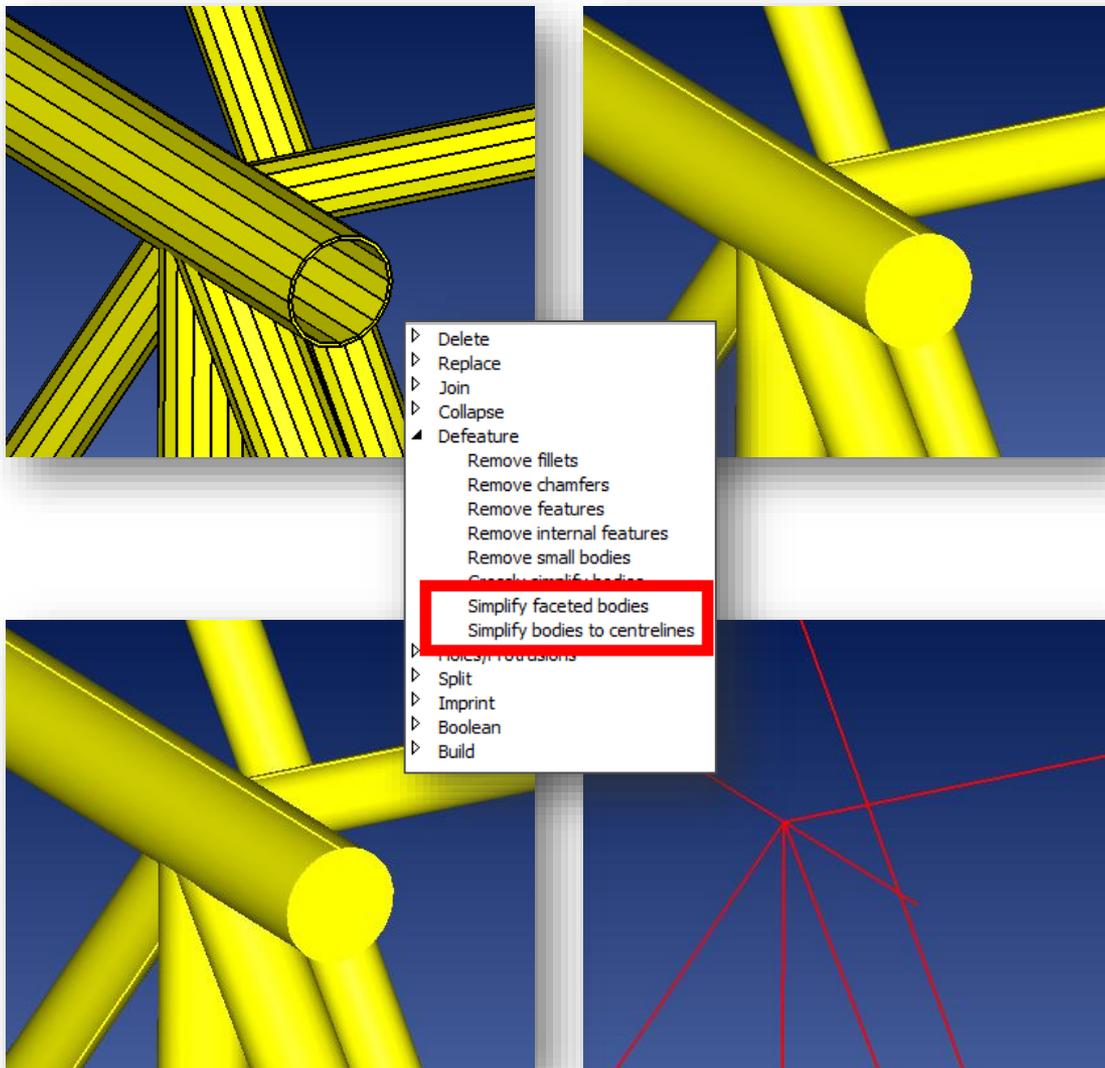 - Faster and more robust matching

Assemblies

- Faster handling of large assemblies
  - Speed-up of box selection tool
  - Speed-up of assembly tree selection and deletion
  - Speed-up of assembly exploding
  - Faster export of large assemblies
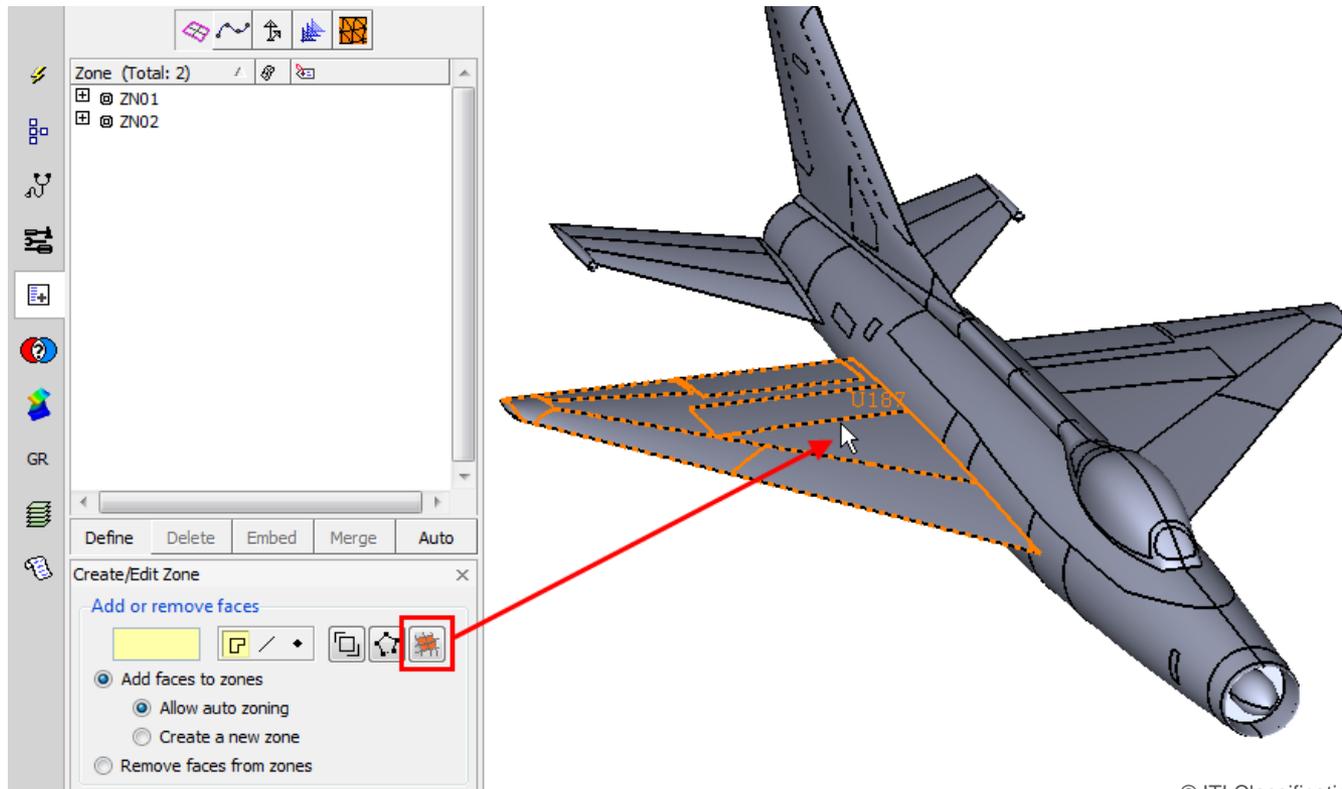 - New option to remove scaling in transforms

Defeature

- Faceted primitive body to solid body
  - Cylinder and cone primitives
  - Solid or tubes
  - Whole or halves

- Primitive solid to centreline
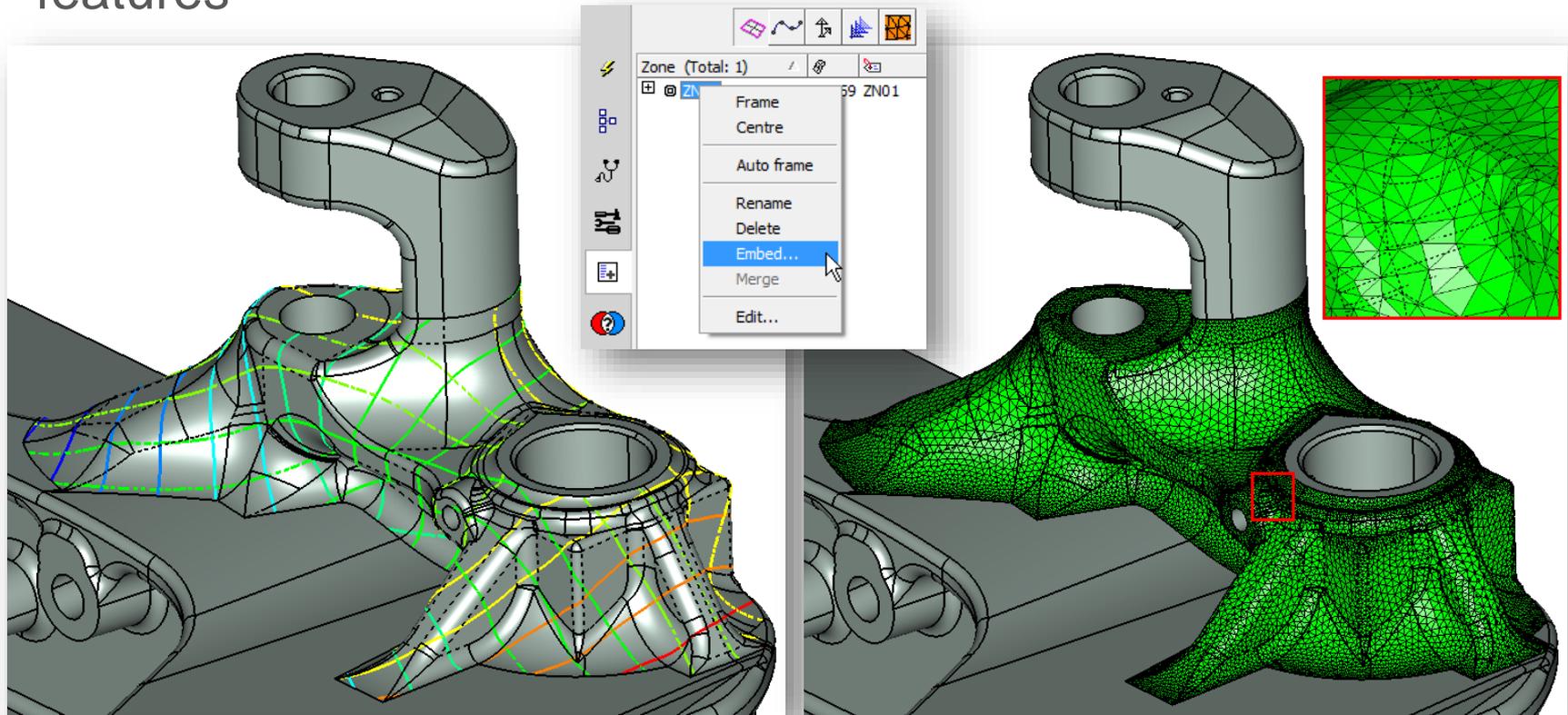 - Cylinder and cone solids

Zones

- Build zones quickly using smart selection
  - Smart selection tool for picking carpets of tangential faces is now integrated in to the zone manager
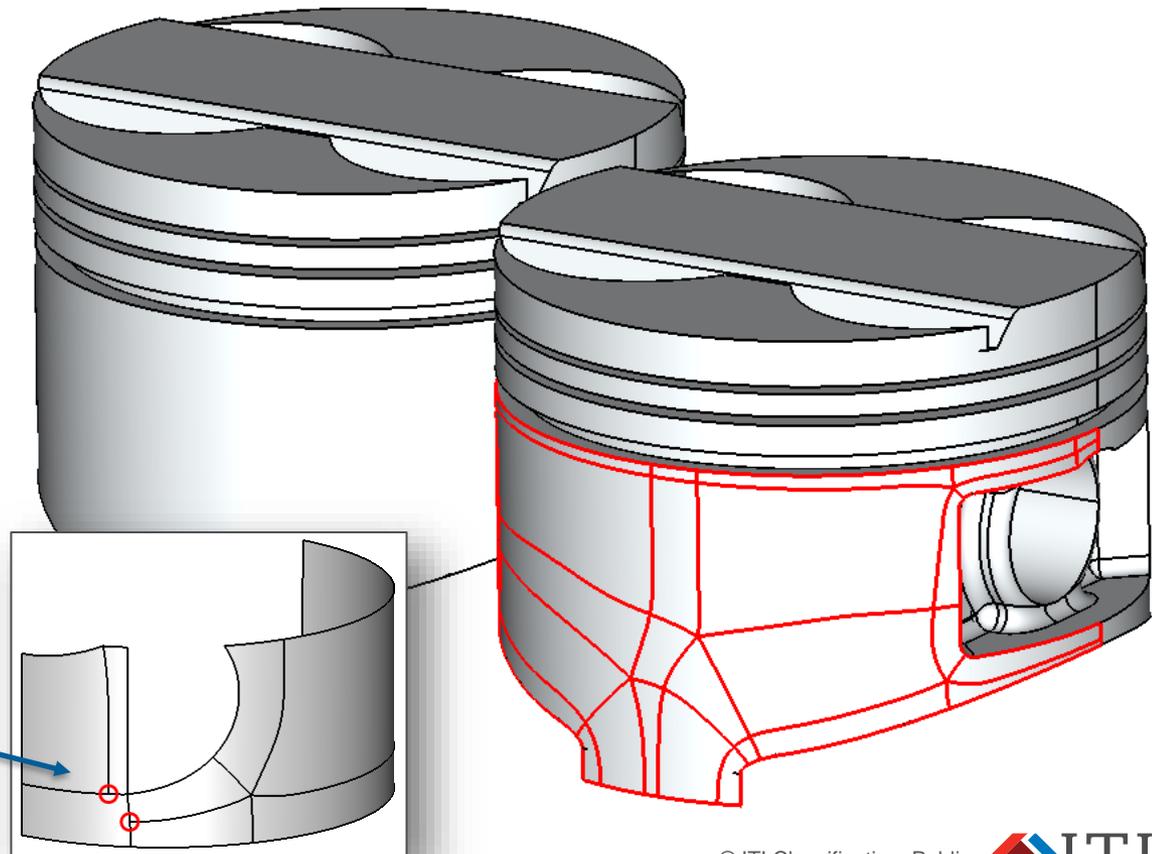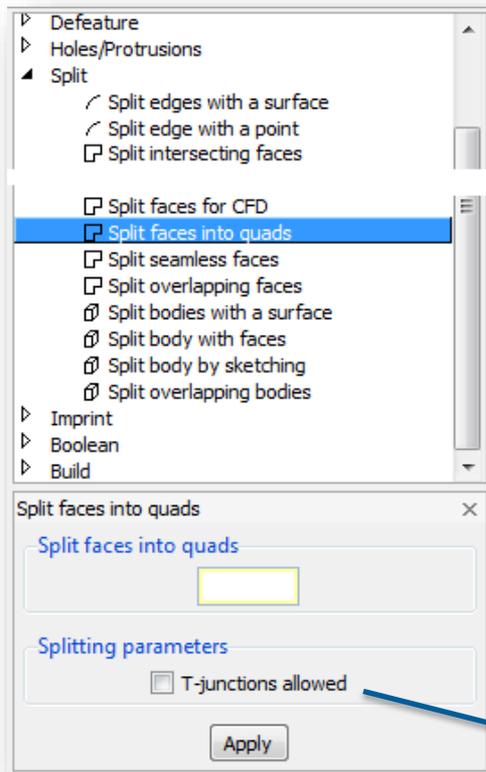 - Enables rapid creation or large zones

Facets

- Complex zone parameterisation
  - Robust, unfolded parameterisation of large complex zones
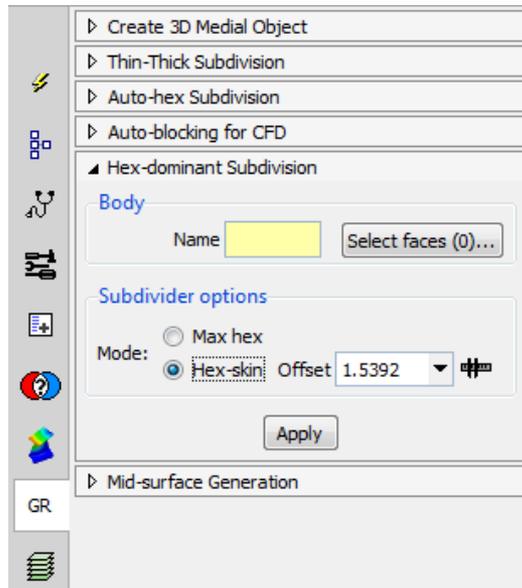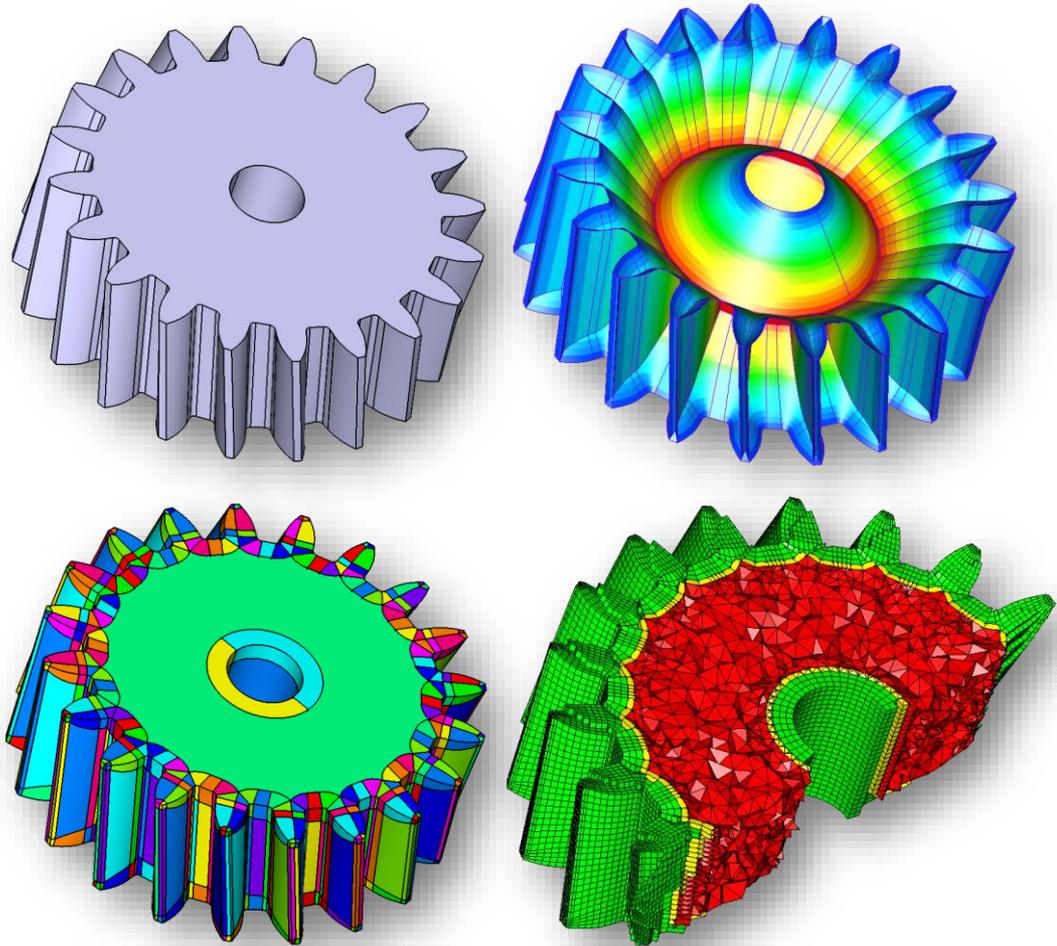 - Enables extensive use of virtual topology to avoid small CAD features

Defeature

- Cross-field based automatic quad splitting
  - Subdivide a face in to well aligned quad regions
  - Highly quad-dominant with optional t-junctions

(prototype)

Defeature

- Hex-skin partitioning tool for hybrid meshing
  - Powered by CADfix Medial Axis
  - Skin depth user controlled
  - Skin blocks hex meshable

(prototype)

Wizard Macro API (cwi)

- Big expansion of the CADfix Wizard macro API

- Now over 400 separate functions available

- Most areas of the interactive GUI are now script-able

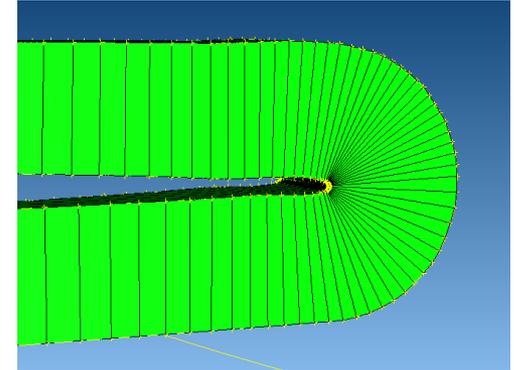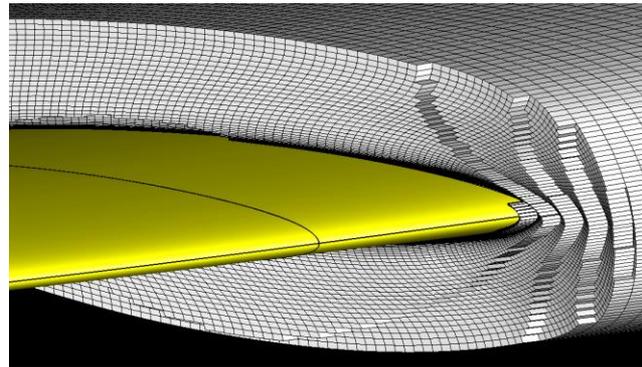- New macro recording tool provides easy way to capture a script

Miscellaneous

- Performance boost
  - 3-5x faster than CADfix 11 for many operations
  - Faster evaluation and projection operations on NURBS surfaces

CAE Mesh Generation

- New Hermite TFI quad/hex mesh generator
  - MSTY: HTFI
  - Ensures ortho-gonality with wall

- New CVT tri mesh re-mesher/smoother
  - Very high quality tri mesh
  - PROC MGEN DELM SMOOTH CVT TR 10

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