GiD v12 news

GiD Developer Team:

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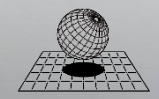
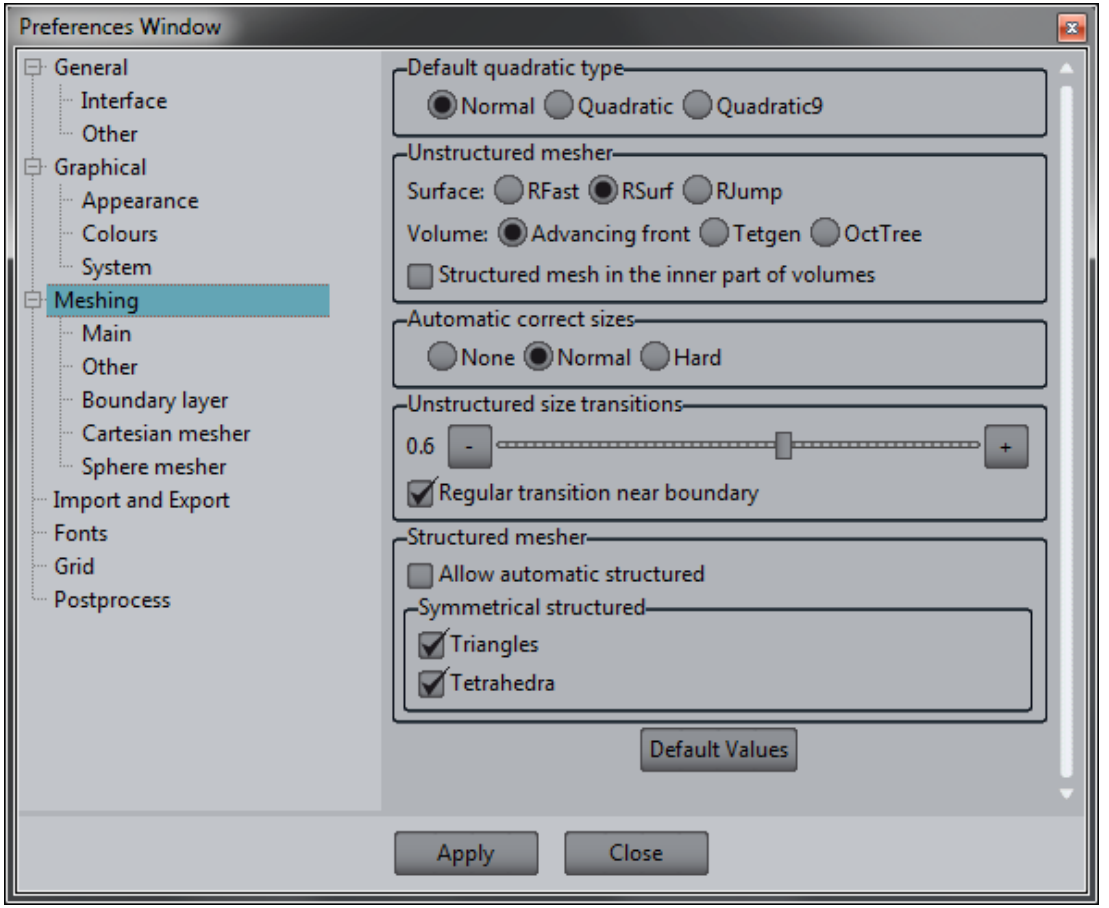


New preferences window

New preferences window:

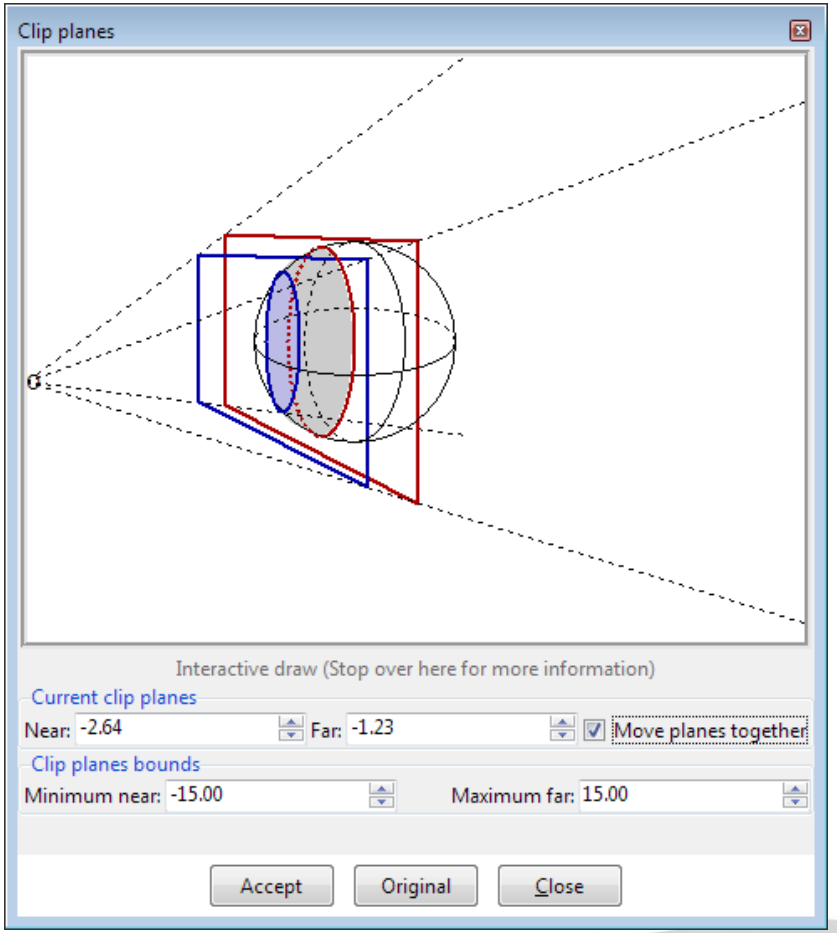
- Tree to organize the different groups of variables
- Branches highlighted in red when some variable changes
- Button to set the default values



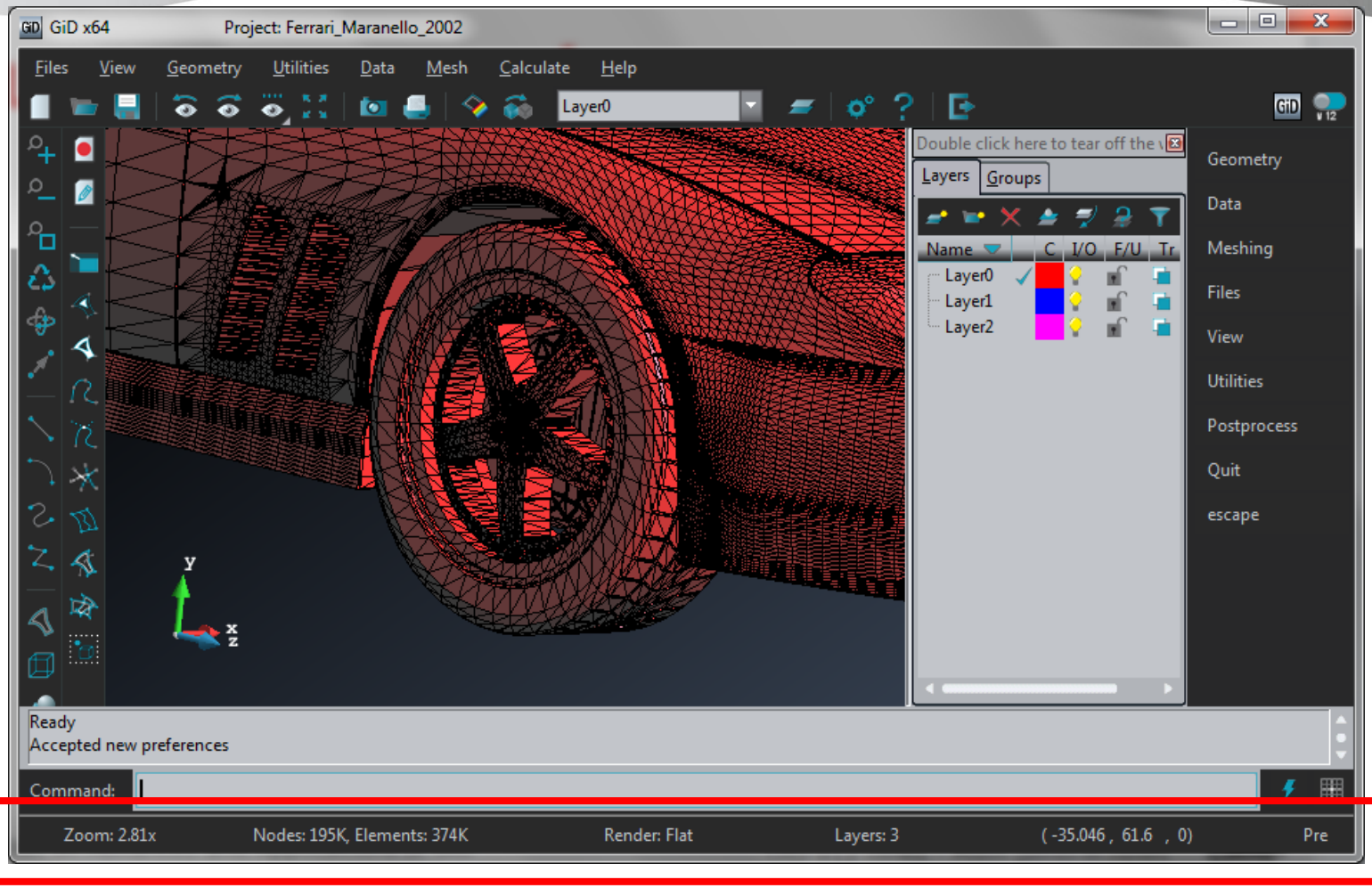
New clip planes window

Full redesign of clip planes window:

- A more intuitive way to see result of clip planes, and user point of view of the model.
- Easy selection of near and far plane, moving planes together maintaining the distance or independently.
- Full graphical interaction, all you need is click an drag over canvas.



New status bar

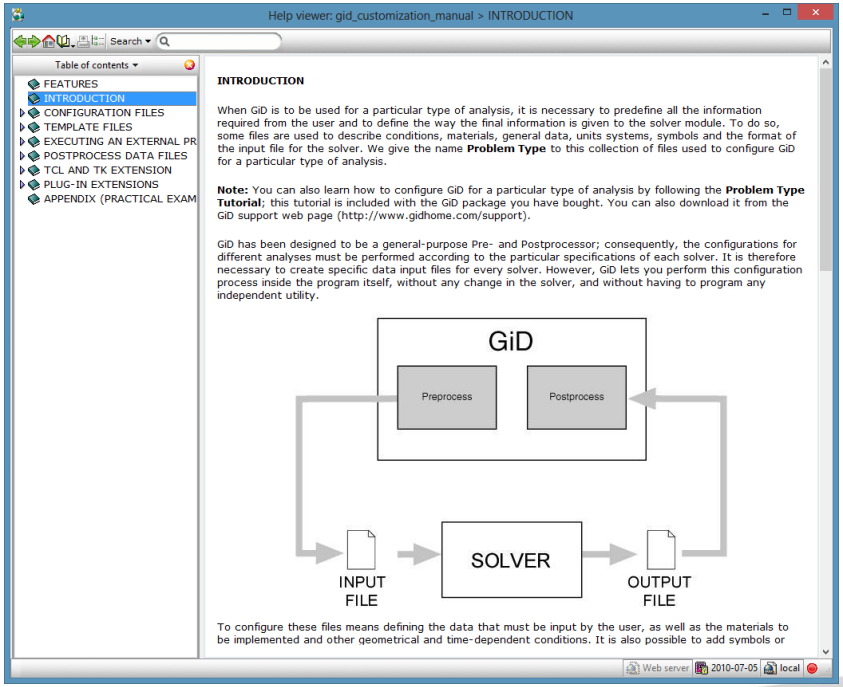


Basic information of the model and the working mode of GiD

Enhanced help viewer

New help viewer using Lognoter:

- Allow print or convert to pdf, html or Word formats
- Fast search
- Easier use with a single file
- Free editor (www.compassis.com)
- Local or collaborative database.
- Multilingual support
- Simple image editor

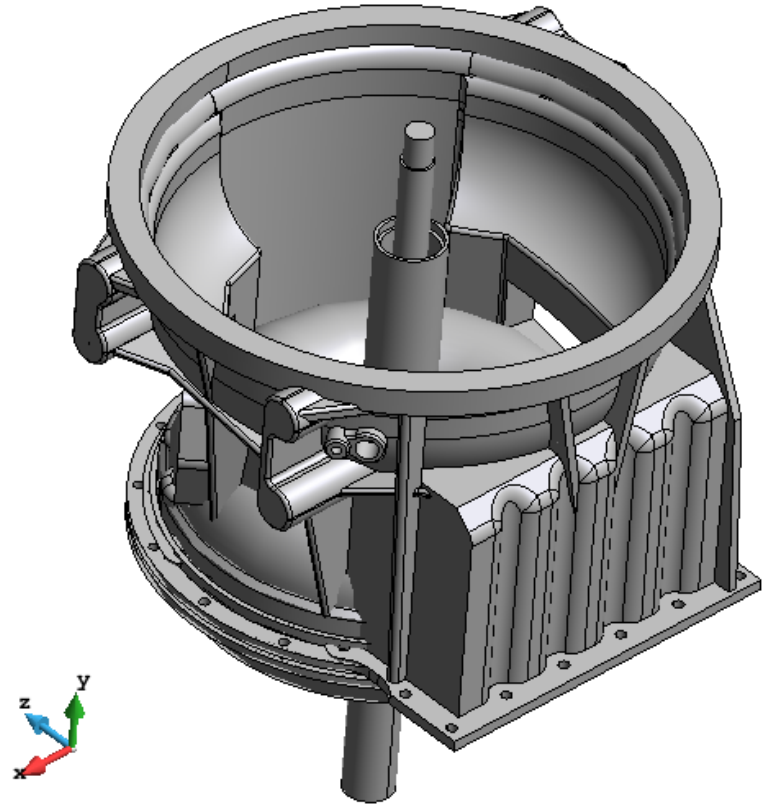


Other general news

- Added new acceleradors:
  - Control-1...4 for views
  - Control-t to focus on command line
  - Alt+Mouse to snap dynamic lines to horizontals, verticals or 45º diagonals.
- Improvements and new vectorial prints: Postscript, PDF, SVG.
- MouseWheel now zooms the model directly, without require pressing the <Shift> key

STEP import

STEP import for AP214 (Automotive Application protocol)

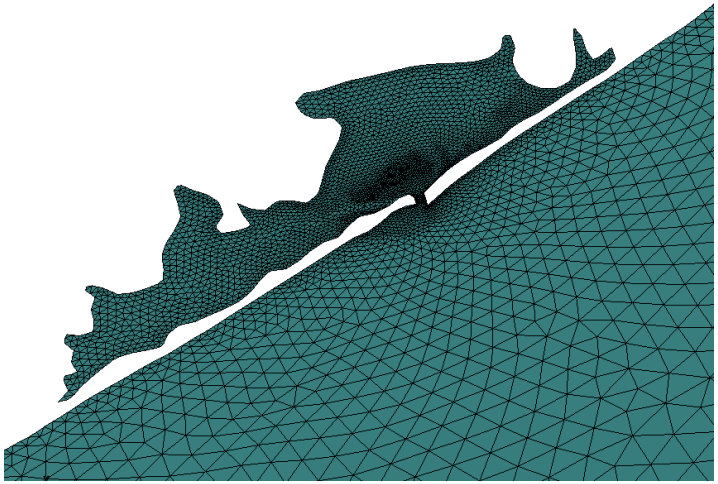


Example of a mechanical piece imported in GiD

KML mesh import

KML is a 'Google Earth' format

- Implemented as an optional plugin
- Import as preprocess mesh (kml vectorial)
- Allow compressed .kmz format
- Transform from geodetic coordinates (to UTM or other)

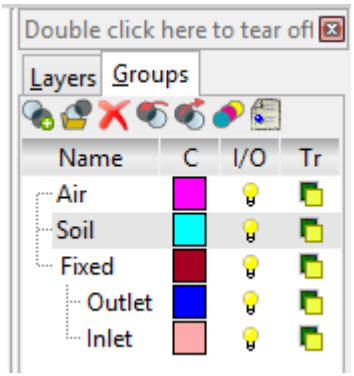


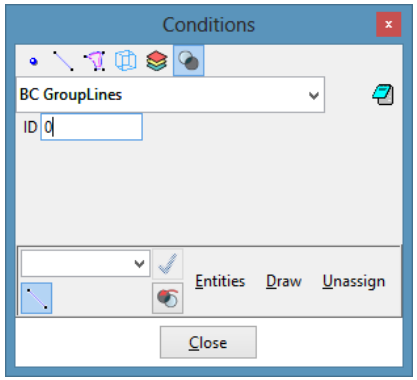
Mesh of a port imported from SMS Aquaveo through KML format

Native groups

Group is a new entity attribute to classify in parts:

- Similar to ‘layers’ but entities can belong to more than one group.
- Similar to ‘conditions’ but they don’t depend on the ‘problemtype’
- Facilitate the conditions assignment
- Access to groups definition and assignment also from programming level (Tcl and .bas templates)

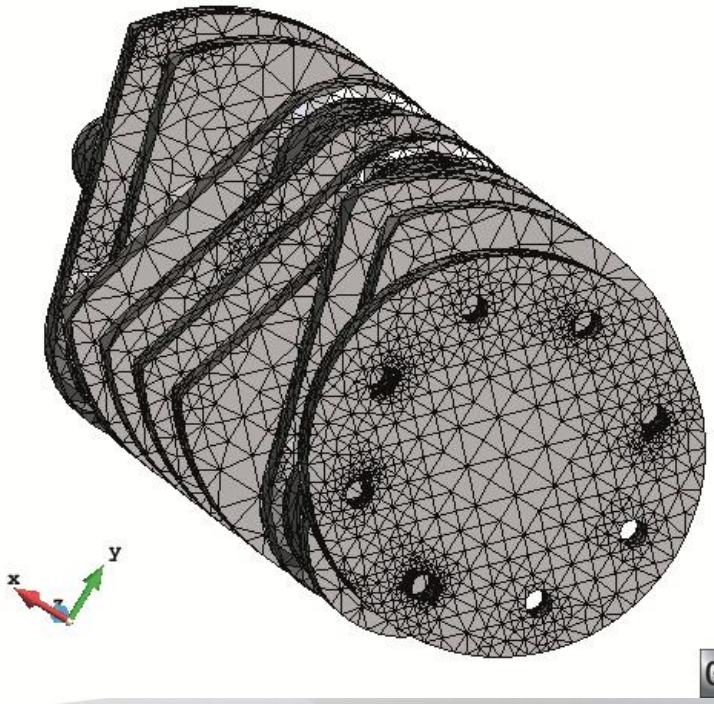




New octree based mesher

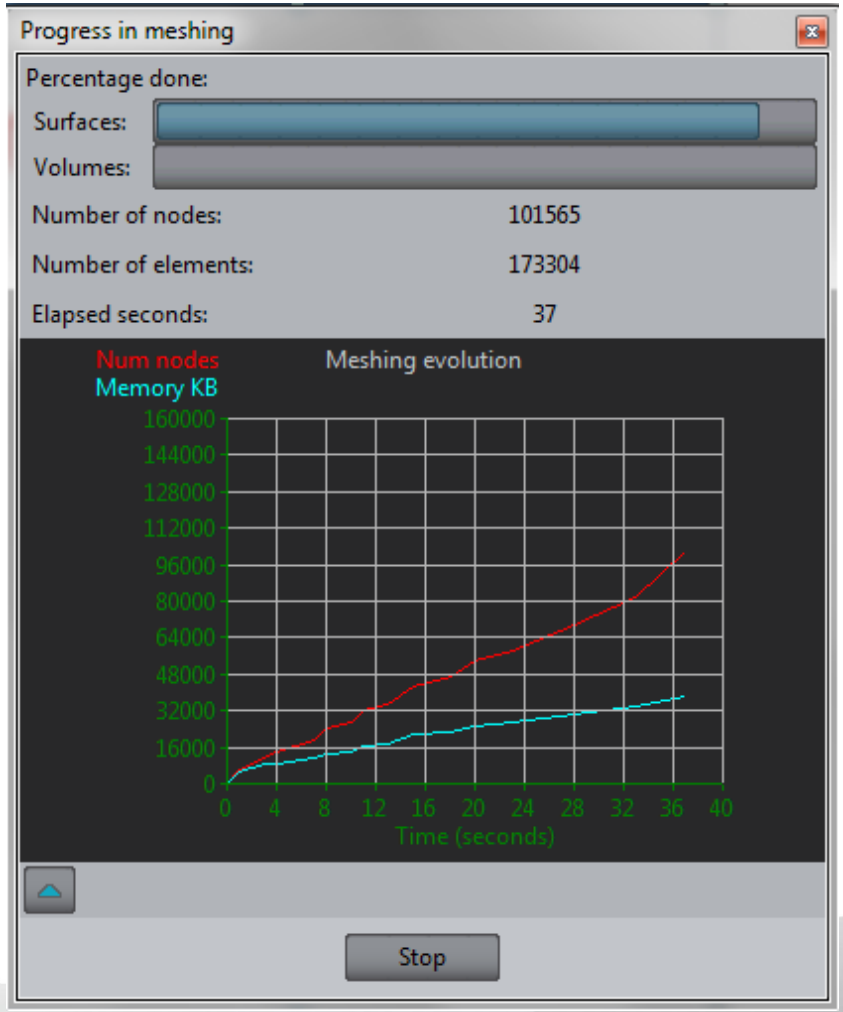
New unstructured tetrahedra mesher

- Robust and fast (parallelized with OpenMP)
- Allow non-cleaned geometry as input
- Up to 18 Millions of tetrahedra per minute



New window for meshing progress

- Bar indicating percentage done
- Number of nodes and elements generated in real time
- Elapsed time
- Graph indicating memory consumed and number of nodes

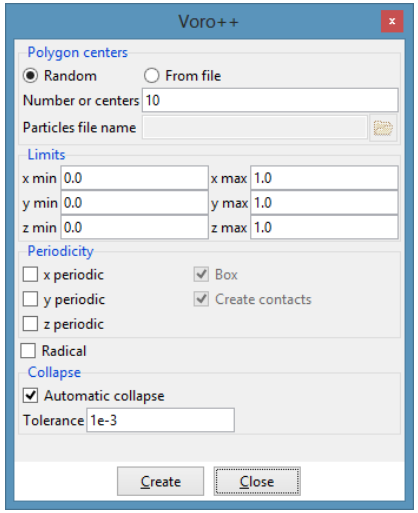


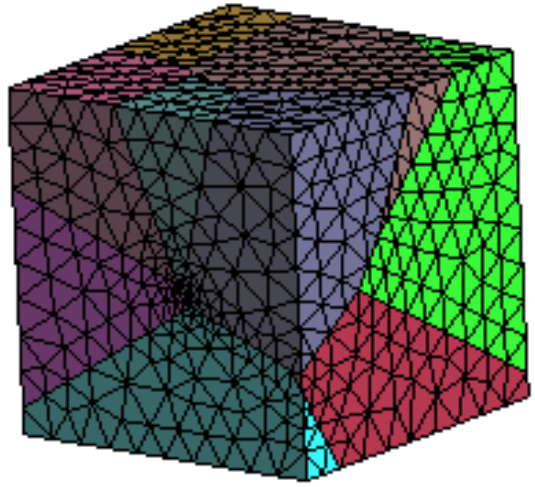
Voro Plug-in

Voro is a GiD-plugin that wraps voro++ (open source)

Create a GiD box splitted in random Voronoi tessellations

Periodic shapes can be created.





Voro parameters and its resulting geometry meshed in GiD

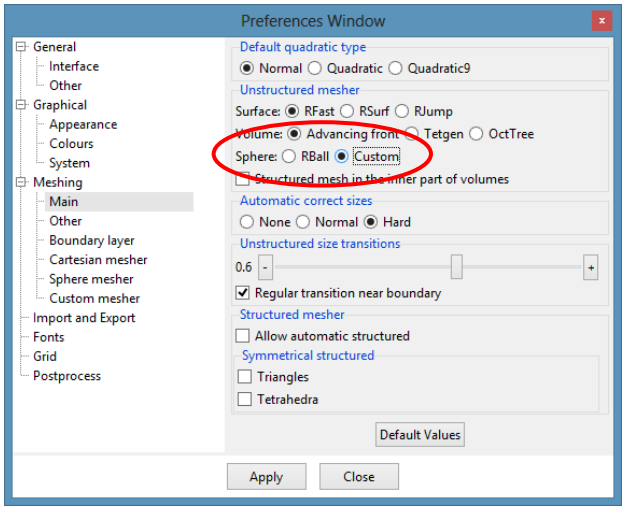
Other news in preprocessing

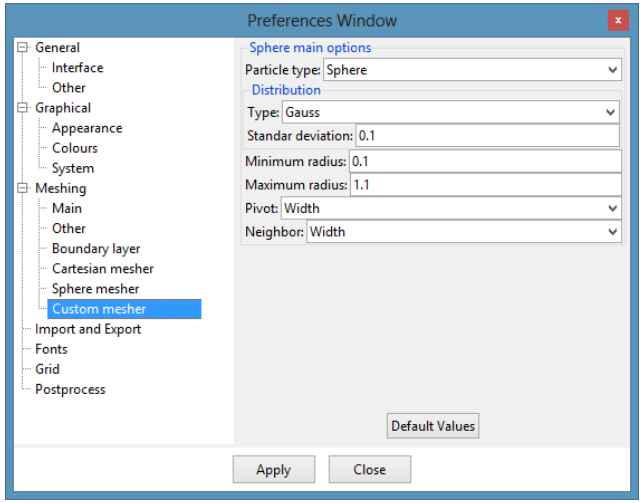
- Parallel processing in more meshing operations, following shared memory paradigm (OpenMP).
- Variable AlignSemiStructuredNodes to force the semi-structured volumes to have the structured nodes aligned
- Entities in frozen layers drawn in grey
- Now the mesh is also imported when selecting 'insert GiD geometry'.
- Faster rendering for spheres and points (use of textures)
- Legends: same options as in postprocess (set opaque background and option to add border)

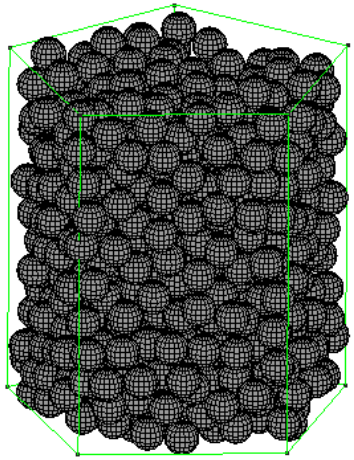
Plug-in mechanism for meshers

Implement new meshers as external Tcl plug-ins

- Show in preferences the new mesher and its parameters
- Store the applied parameters with the model and in preferences
- User appearance like another internal method.
- Initially only implemented for spheres generation







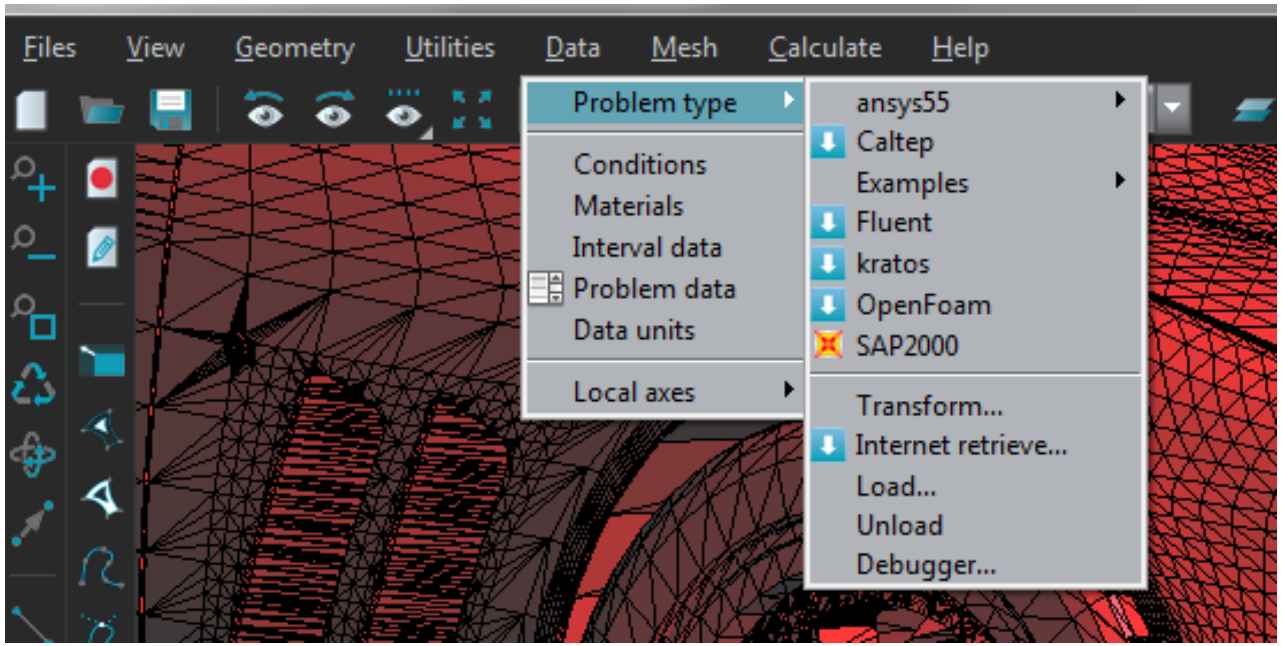
Preferences of a new sphere 'custom mesher' and its mesh

New Tcl/Tk commands

- Tcl/Tk updated to version 8.6
- New GiD-Tcl events (AfterSaveFile ,AfterCreateVolumeSet,…)
- New GiD Tcl special commands (GiD_Graph, GiD_Book, GiD_File, GiD_Groups, GiD_EntitiesGroups,…)
- More Tcl procedures to aid developers
- Added more third part packages (lognoter, full tcllib and img, gdi, printer, twapi,…)
- Updated versions of previously used packages

Other news in Customization

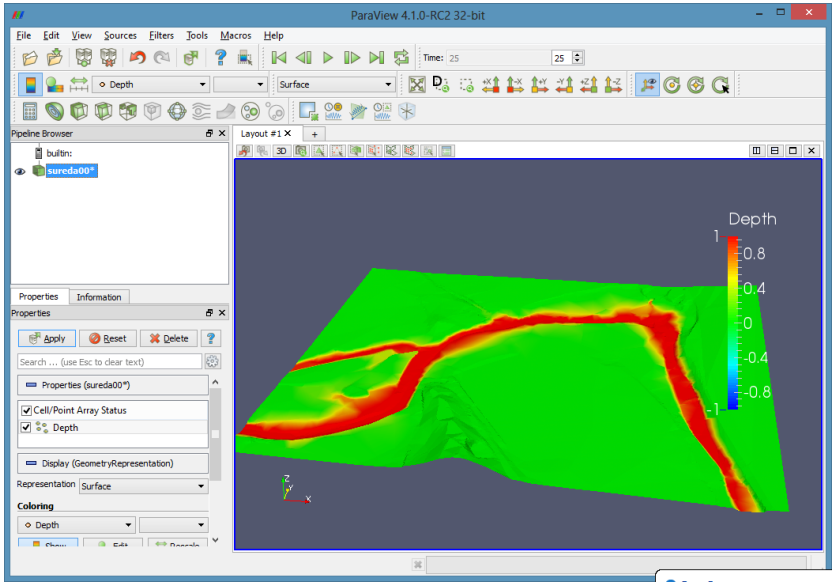
- Macros: checkbox to show only the list of user-defined macros
- Calculation module can appear in the Data->Problemtype menu, and when user clicks it is automatically retrieved



VTK results export

VTK is graphics library widely used in simulation

- Implemented as an optional plugin
- Exports all kind of postprocess mesh and results
- Option to write ASCII, binary or compressed format

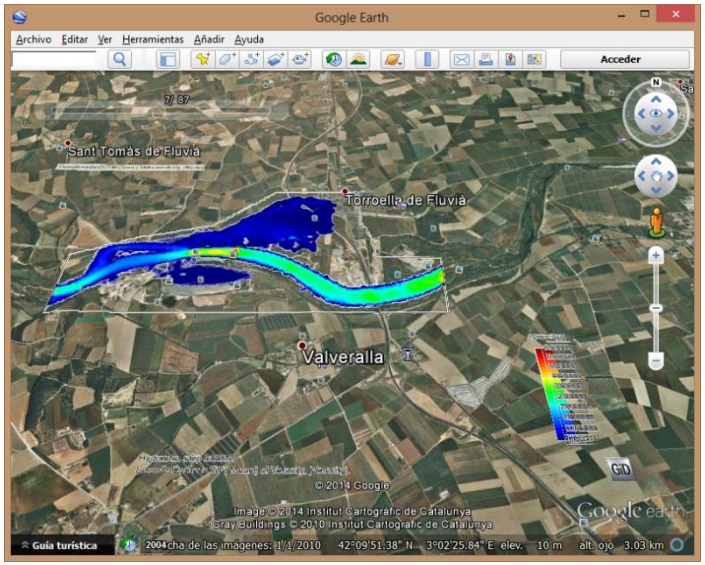


Results of a river simulation of Iber imported in ParaView

KML results export

KML is a 'Google Earth' format

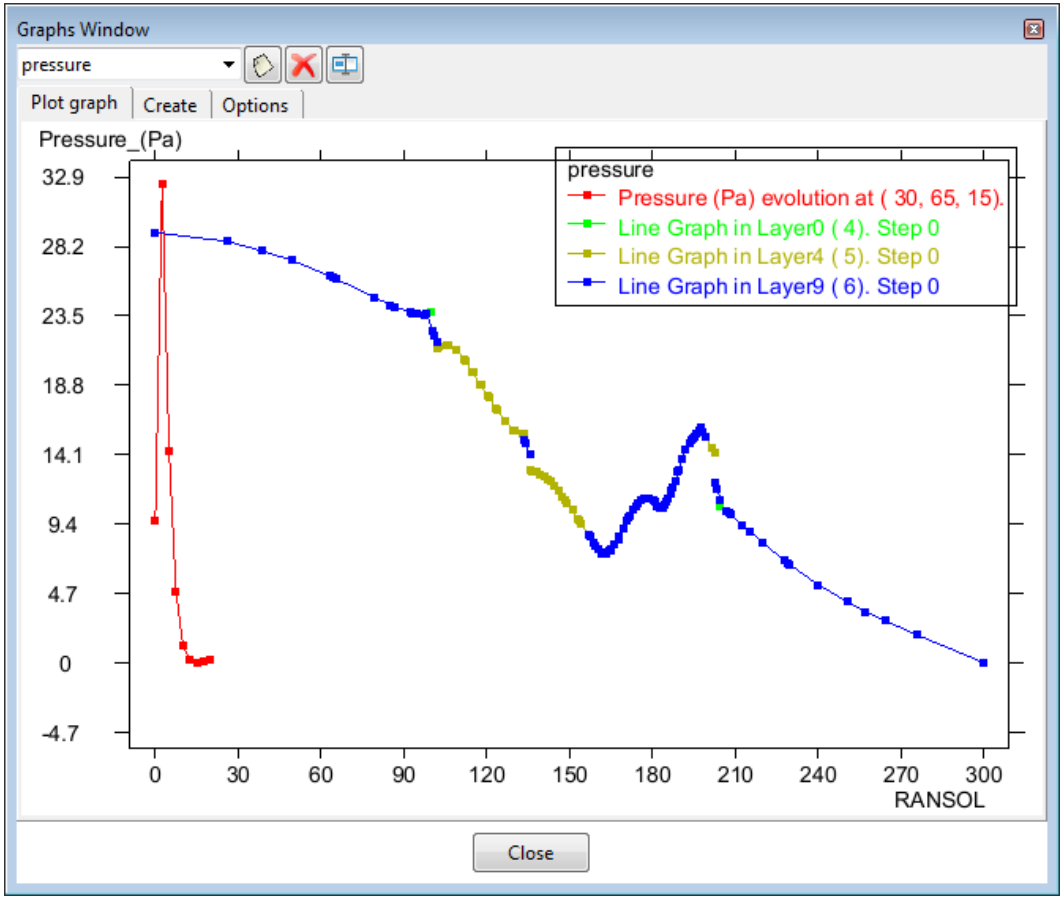
- Implemented as an optional plugin
- Export mesh kml vectorial or as screen images
- Write animations along the time a a collection of screen images
- Allow compressed .kmz format



Animation of a river simulation of Iber imported in Google Earth

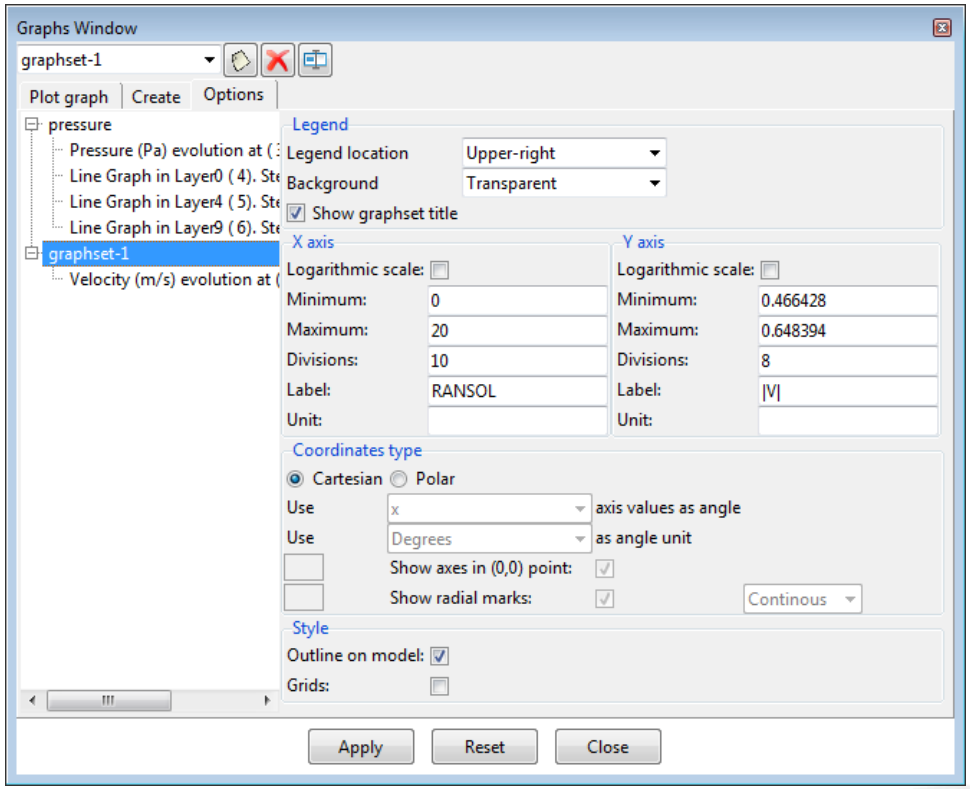
New graphs window

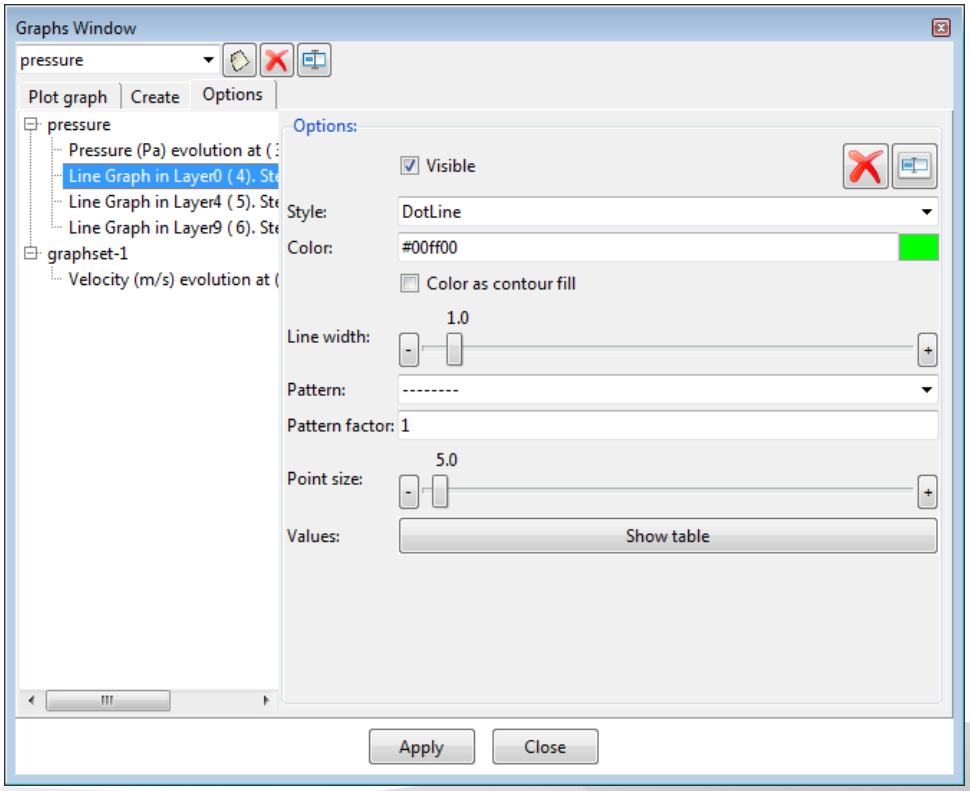
- Enhanced graph window
  - Complete graphs management in only one window
  - Reorganized tabs
  - General options applied for whole graph set
- Graphs grouped in several graph sets:
  - Same axes for all the graphs
  - More clean display
  - Change between graph sets easily
  - Select which graphs displayed in each set
- New GiD_GraphSet function



New graphs window

- Tree organization
  - Hierarchical structure
  - Easy management

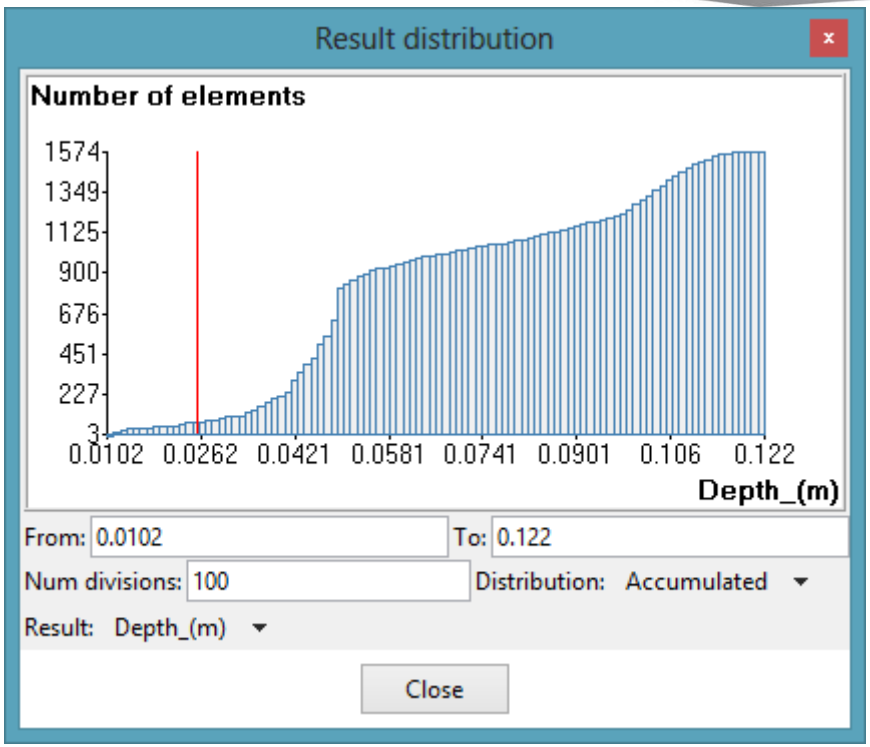




Results distribution window

Results values distribution:

- Scalar
- vector component
- matrix component



Modes:

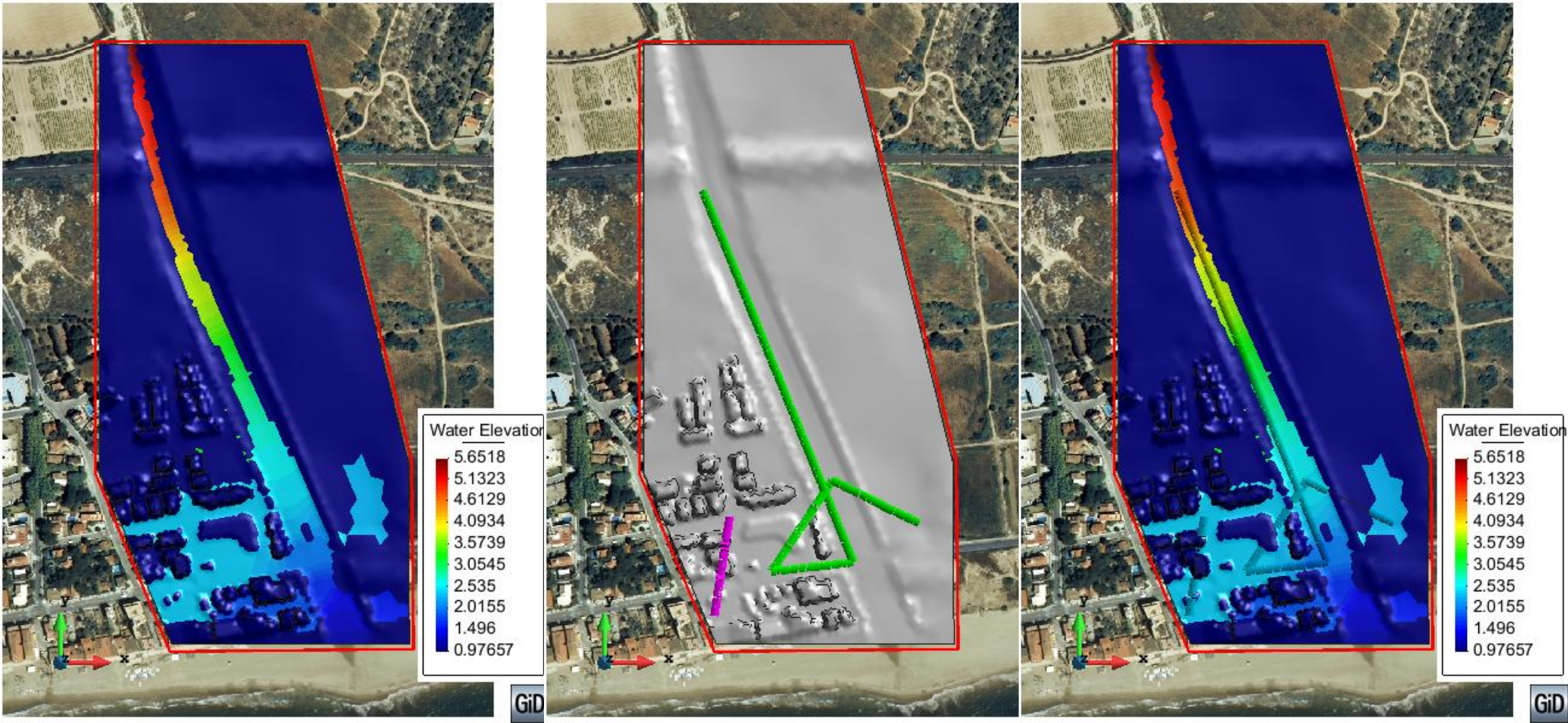
- Normal - # items per group
- Accumulated - # items smaller or equal to value

Minimum and maximum limits adjustable

Double click: shows in red values equal or smaller

2D polygonal cut

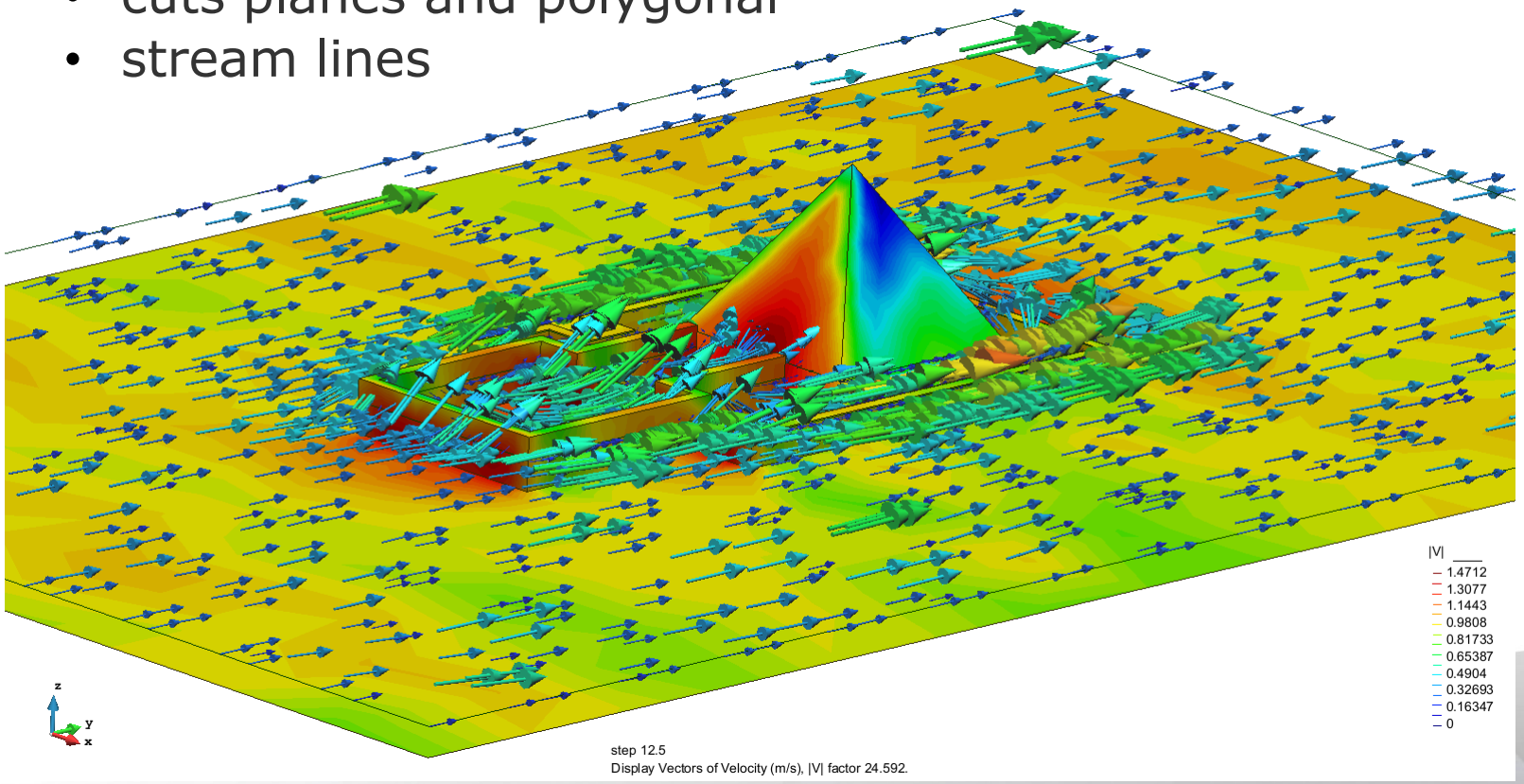
Uses a segment or polygonal to cut triangle or quadrilateral meshes.



State of Post saved

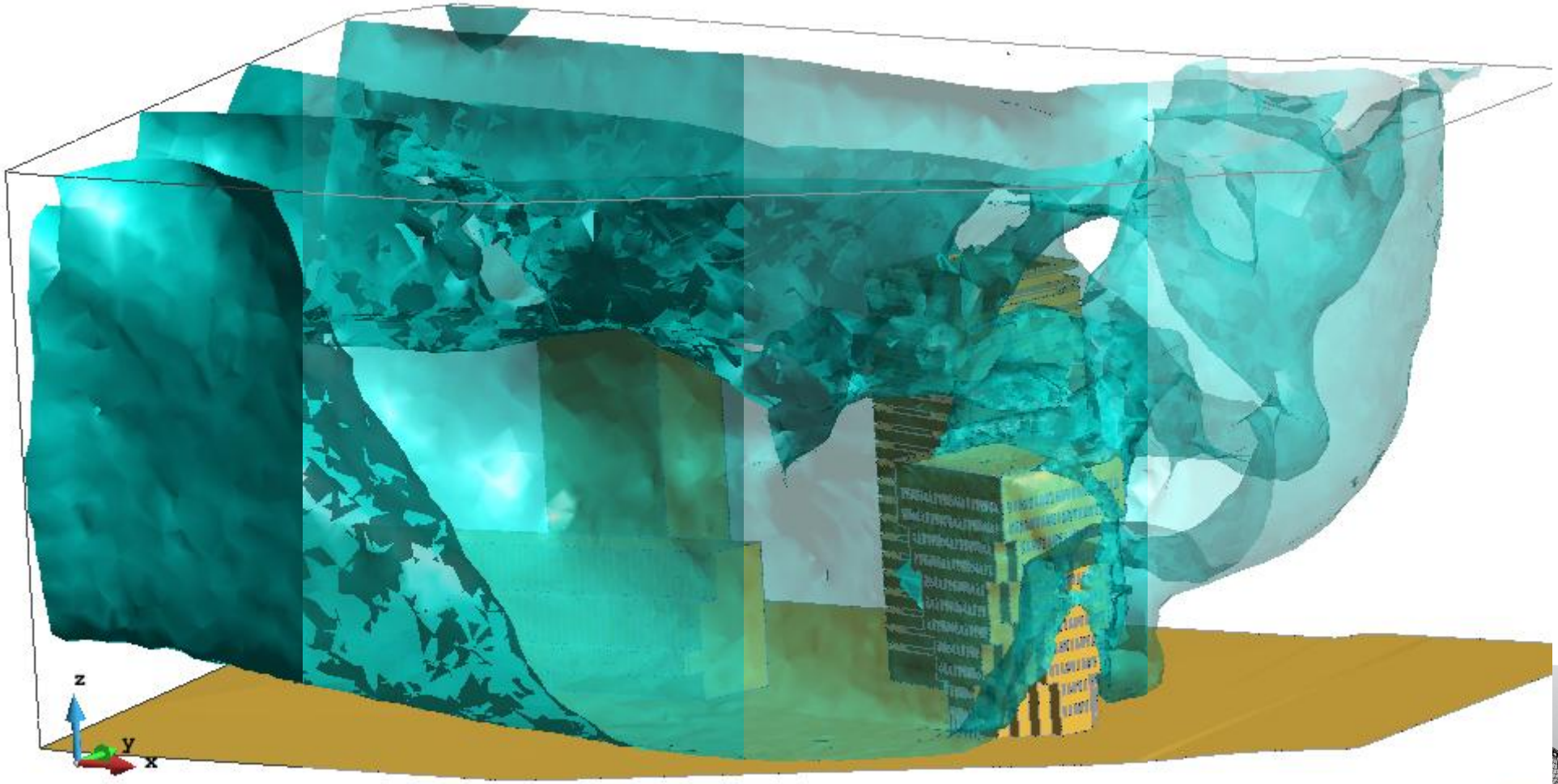
Saved state between sessions:

- view parameters, colour and style of meshes
- current results view: contour fill, iso-surfaces, …
- cuts planes and polygonal
- stream lines



Transparency for isosurfaces

Transparency factor adjustable for iso-surfaces:



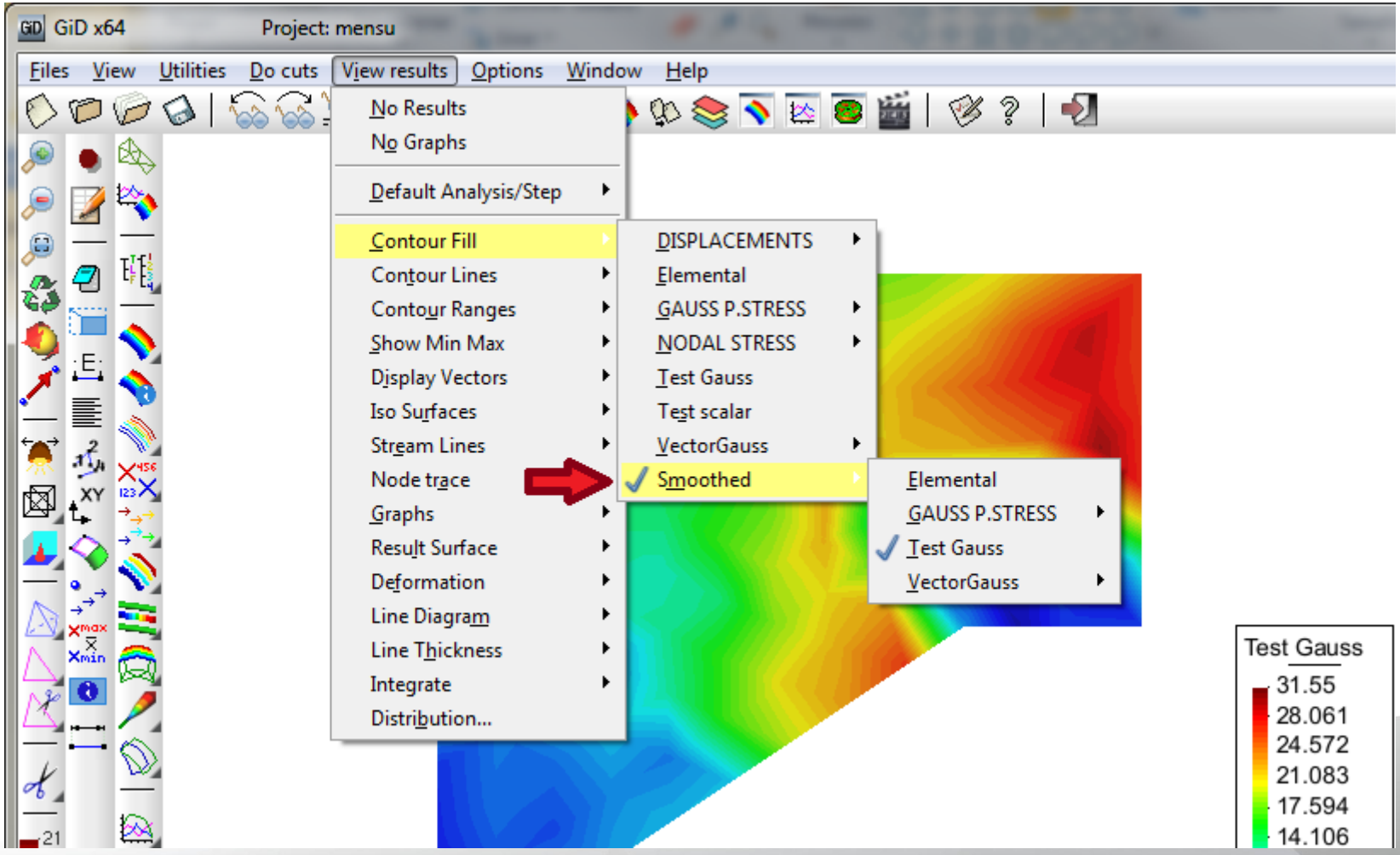
Results visualization with gauss points

- Visualization of **discontinuous** Gaussian results:
  - Contour fill & lines, show min max, display vectors, iso-surfaces, results surfaces, line thickness, line diagram
  - Except: contour ranges, stream lines, node traces, graphs, deformation

- Visualization of **smoothed** Gaussian results:
  - Contour fill & lines, iso-surfaces, graphs, results surfaces, line thickness, line diagram, deformation
  - Except: contour ranges, show min max, display vectors, stream lines, node traces, deformation

Results visualization with gauss points

Added sub-menu with globally smoothed Gaussian results:



Other news in postprocessing

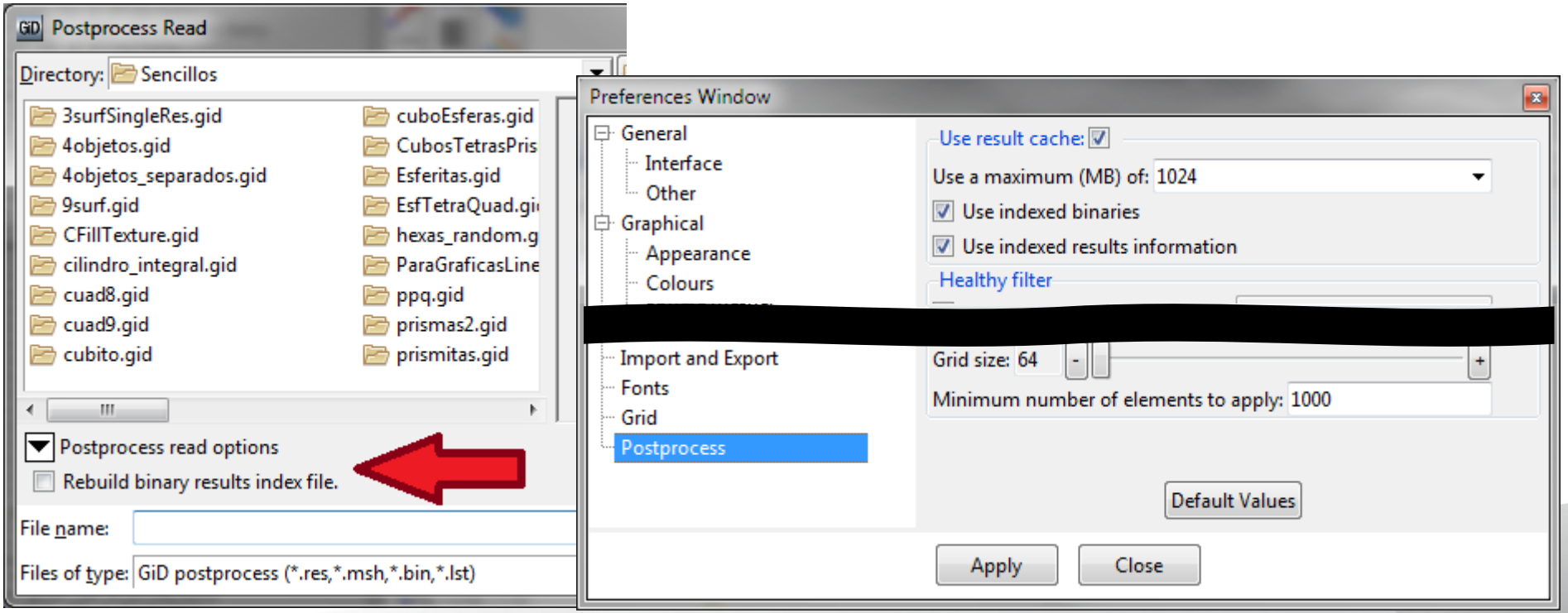
- Multiple results in GiDPost library
- New Calculix plugin, to import 'Calculix' .frd mesh and results in postprocess (Files->Import->Calculix...)
- New ‘Line thickness’ result visualization: draws lines with the diameter of the result (contact forces)
- XYZ import with triangulate / tetrahedrize options
- Stream lines 2D constraint (z coordinate neglected)
- Scale transformation
- TCL command in comments %tcl()
- Swap 2d-element connectivity

Outline

- Main general news
- Main news in preprocessing part
- Main news in customization
- Main news in postprocessing part
- Working with large models
- Future lines
- Round table

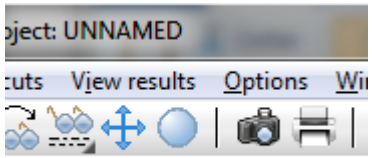
Indexed binaries for Results Cache

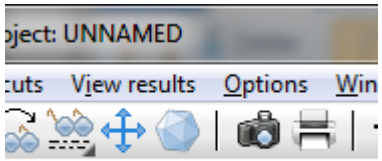
Faster parsing and access to results
Automatically detects if results file is newer
Can be recreated

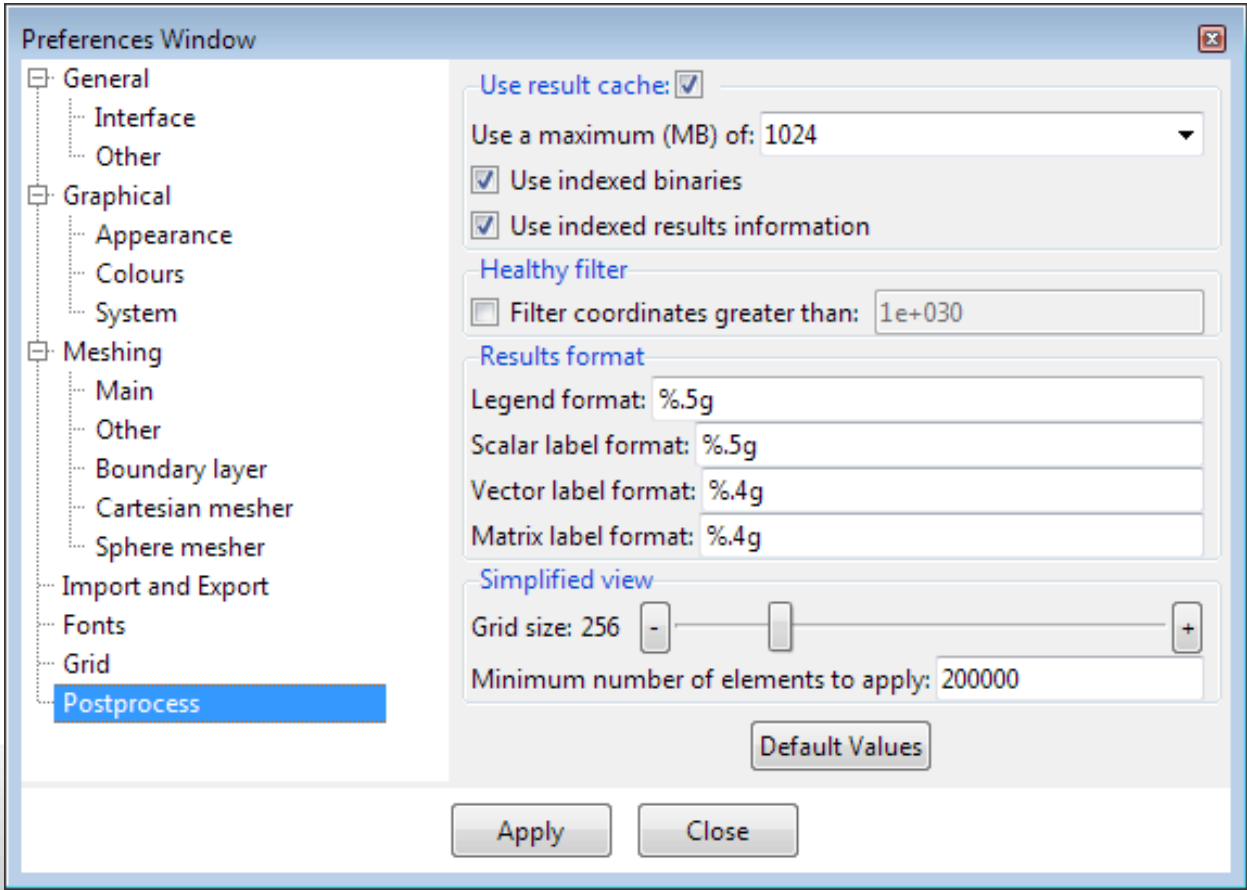


Simplified view

- Vertex clustering with normal cone filter and cell-average of attributes
- Fast rotation mode
- User enabled:





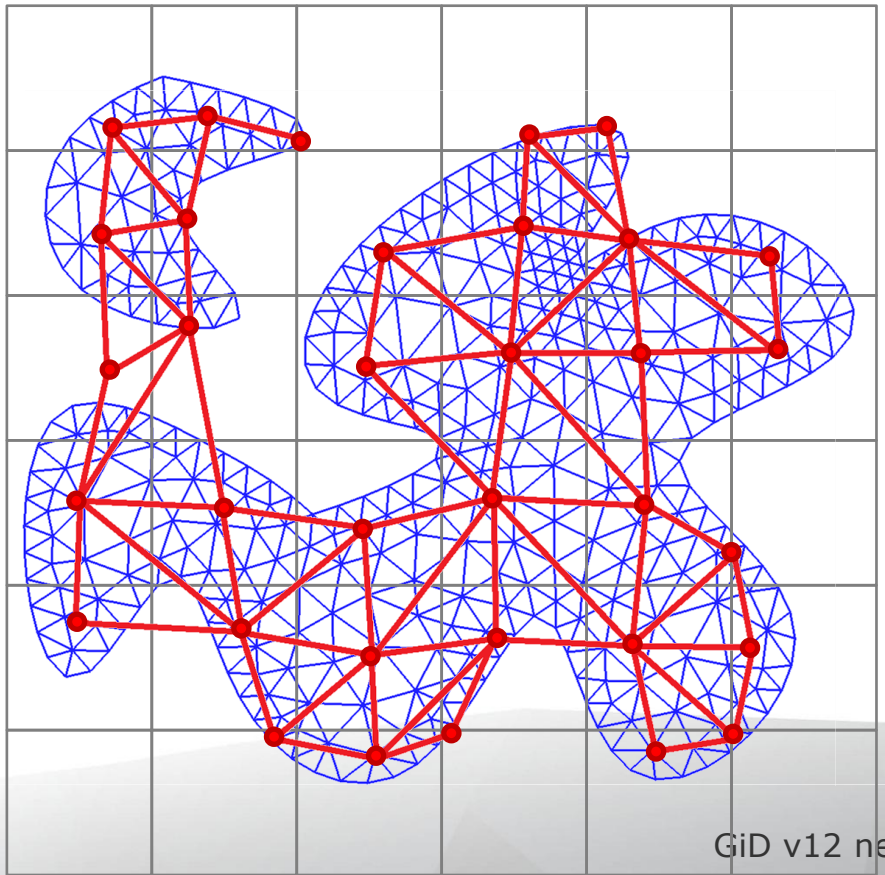


Vertex clustering

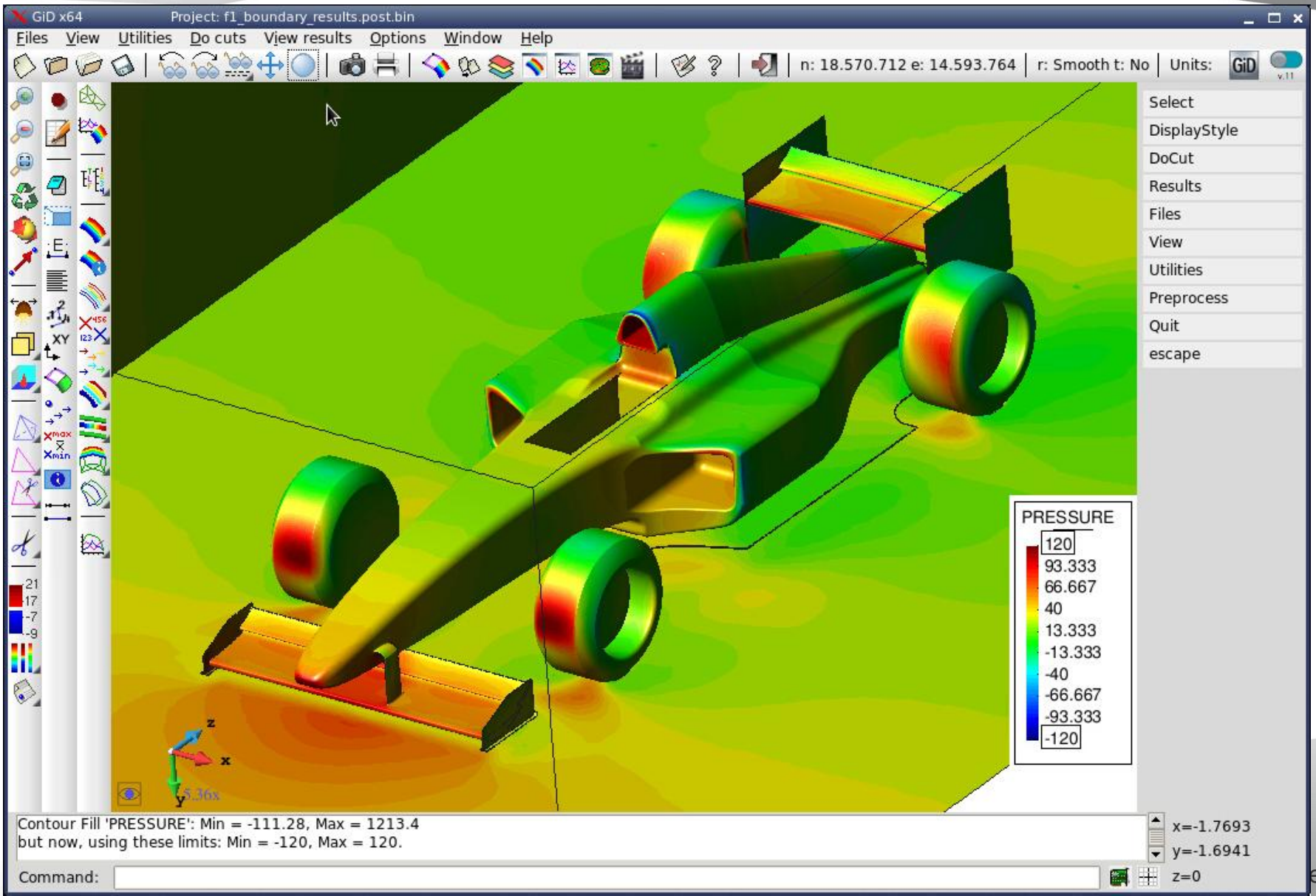
First step: group vertices into cells

Second step: calculate optimal representative

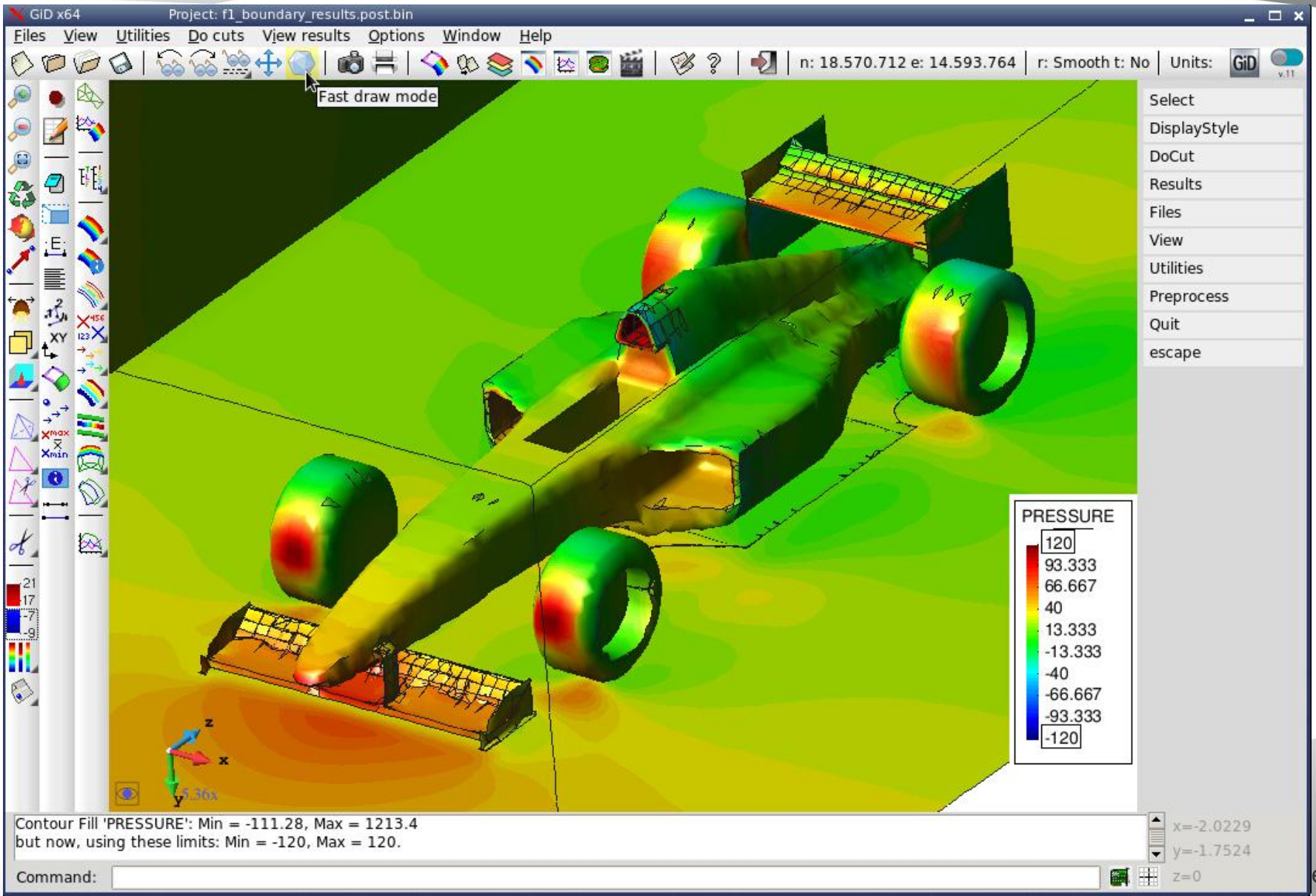
Third step: simplify input mesh



Simplified view



Simplified view



Simplified view

F1 racing car model

		VNC remote visualization		Entry-level laptop	
	# triangles	Geometry	Contour fill	Geometry	Contour fill
Original model	6 M	0.43 fps	0.25 fps	0.48 fps	0.40 fps
Simplified model	179 K	7.1 fps	2.8 fps	16 fps	12 fps
Simplification time		7.5 s.		12 s.	

VNC remote visualization:
- Master node of cluster: 8 cores
- 2 x Intel Xeon(R) CPU E5410 @ 2.33GHz,
- Mesa 3D software graphics
- Scientific Linux 6.1

VNC client: MS Windows 7, x64 bits

Entry-level laptop:
- ULV Dual Pentium SU4100 @ 1.30GHz,
- Intel graphics
- MS Windows 7 x64