

Date: October 10 2017

Version 4.6.1

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- * **GUI:** Fix the help system issue with V4.6.0. The help system is not available from GUI for some users when the version 4.6.0 is installed.
- * **Solver:** Fix the mass conservation issue when the explicit and 2nd order Range-Kutta method is used.
- * **Solver:** The damage power and gas volume fraction distributions are missing from wall bc.

Version 4.6.0

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- * **All:** Allow user to create template for a problem and reuse the settings for modules, bcs, vcs, ... as long as the key geometry entities are intact.
- * **Solver:** VOF Multiphase: 1. Add and correct back input back compatibility for parameters 2. fix read in project explicit time scheme changed issue; 3. change the default setting for explicit vof, default scheme rk2, default courant number 0.5, adaptive courant number true
- * **Solver & GUI:** Add malloc functions for Metis and add option to use five sublevel refinement
- * **Solver:** Change integral output, remove old control from volumes and fixed control parameter resets in boundaries
- * **Mesh and Geometry:** Fix surfaces add and libraries build
- * **Mesh and Geometry:** Add volumes names by predefined surfaces or its common prefix, fix preset refines reset, Add option to add empty new surfaces to surfaces parameters and move sorting and removing duplication to validation in order to fix rename, Add sub level split by refine box zone and improve transition by removing some artificial big degenerated cells, Change volume/patch names to be sorted by size during build.
- * **Post Processing:** Fix crash if color change is selected while other values are updating, Fix multiplying of text labels when applying stored view.
- * **Solver:** Add validation of volume fraction for bc
- * **Solver:** Fix particle size has no unit
- * **Template:** Scroll template: fix for rotors with large inner space
- * **Template:** Crescent template: add ability to deform a selected gear if inner and outer cross or get too close.
- * **Template:** Vane template: Fix crash for curevd rotor when rotor bc has multiple patches.
- * **Template:** Fix shrink rotor issue with non-uniform gap options for vane pump
- * **Template:** Vehicle: Flow direction for outer fan mesh corrected, grille refinement is set last, radiator surface used for setting properties changed.
- * **Template:** Vehicle: Changes to Vehicle Template for updates to general mesher: refinement in box, naming by size, build box for debug
- * **Template:** Vehicle: 1. Additional checks to prevent large fan blade mesh 2. Check repeating surfs between vehicle and tunnel 3. Option to add surface refinement to mesh or only for definition, Changes for new naming rules for boundaries and split interfaces.

* **Template:** Vehicle: Update calculation of outputs, Additional checks for repeating surfaces in Hex, Fan and Vehicle, correct interface split
Add Vehicle Information in template, Implement refresh of mesh panel when geometry is modified/added

* **Template:** Marine: Add yprofile correction, tune max courant number, adjust buildmarine default, Add Froude number check, add rampUpTime, Add trueTransient option, tune maximum time step, tune refinement zone, tune maxpitchangle.

* **Template:** Marine: tune the parameter, add relaxation parameter access add hull profile identification, improve streak correction, update mesh parameter, change multiphase for semi hull

* **Template:** Marine: tune build mesh parameters, add streaking applying options, add true transient option, fix simulation time different among options, tune multiphase relaxation

* **Mesh and Geometry:** Add spare volumes/patches to geometry
Add mutex to getGeomElements for plugins and fix splitByAngle incorrect check of angle between faces

* **All:** Make libraries compatible with previous versions and enforce new one. New libraries 4.8.7_64_tbb.zip from 'server' are required.

Version 4.4.2

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* **Solver:** 1. Correct wrong unit for bingham viscosity; 2. Change consistency index to no unit temporarily due to correct unit can't be displayed, so SI unit for now

* **Solver:** 1. add parallel min/max calculation to StoreIntegral; 2. add min/max temperature output for heat module.

* **Template:** Vehicle: Add outputs for Vehicle Module, Maintain support for old versions additional surface refinement. Add Surface Based Refinement Zone Definition, Update warning messages

* **Template:** Marine: Add air/water resistance, add shear distribution and its smoothing, add shear torque, default change for displacement hull, Add water and air component force calculation, add cell proportion input, change domain size for displacement. Tune max courant, add froude number calculation, Add time definition, small tune for displacement mesh, Add shear stress display.

Version 4.4.1

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* **Interface:** Fix remote object index for pipe plugins interface. Update connection version add 'plugins' license.

* **Solver:** Change global variable names to use base module when reformulated. Add more loop flags

* **Solver:** Add support for 16 characters fields to all Nastran elements Set default pressure minimum from 0.1 to 100 pa for ideal gas law used in multiphase to improve robustness.

* **Solver:** Set the default value for dv to fix the issue of random number for high order shear term. Add mass fraction averaged viscosity for multiphase module. Fix the max courant calculation by checking courant is ready

* **Template:** Marine: Add external force and torque option, Add resistance output, add input validation, optimize bodyforce, change

projMaxVel to user value, add current_forward velocity option, change getforwardvel to const, set new default for moment of inertia, add more expression for display and expression, reconstruct header file, change the way how prop vector is calculated, add semi hull option
* **Mesh and Geometry:** Fix deletion of volume with empty patches attached.

Version 4.4.0

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* **Solver:** Enhancement to vof module: 1. Adaptive courant number to speed up explicit vof simulation; 2. add courant number distribution output for display; 3. improvement in implicit vof high resolution scheme to enhance sharpness of the phase interface
* **Solver:** Improvement in pressure work calculation.
* **Post Processing:** Add to cross-section and iso-surface blanking related handling. Hide function values in areas where it is blanked.

Version 4.3.5

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* **Solver:** Improvement in Radiation: 1. add transparent bc for radiation module. 2. change the default bc from environment to radiation. 3. link open bc to flow inlet/outlet 4. link opaque to flow blanked.
* **Expression:** Add function to map the values of data points in a table to distributions in boundary/volume, based on the distance from the each grid point to the points in the table.
* **Post Processing:** Add output and control to average/maximum of distributed values in a user defined time cycle. (only activated for cavitation and heat modules in this version)

Version 4.3.2

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* **Mesh and Geometry:** Allow automatically build the mesh and setup the model using only the parameters specified in project file from scratch or from an existing model. This feature enables optimization software to do automatic geometry optimization without user interference.

Version 4.3.1

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* **Mesh and Geometry:** Add symmetry side to interior/exterior mesh build when only build mesh for part of the volume.
* **Template:** Scroll Template: fix bug with building mesh with elliptic smoothing.
* **Template:** added new "Marine" template for ship hull simulation with/without propulsion
* **Template:** new "Bearing" template
* **Post Processing:** New button to access global expression editor in properties panel

Version 4.2.11

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* **Template:** Move "Dynamics" module integrals plot access from boundaries to dynamics module.

* **Template:** Fix Vane point distribution correction sign in small gaps if there is no tip profile

Version 4.2.10

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- * **UI:** Add stop and save to Ctrl-C or if a file named "project_name.spro.save_and_stop" exist when running in batch mode.
- * **UI:** Asking if user want to finish the current time step simulation and save the results, when transient simulation stopped by user in GUI.
- * **Expression:** Make expression function "geom.rotate" consistent with on screen rotation parameters
- * **Template:** add special "Marine" template for "Orca3D" (a marine architecture design plug in for "Rhino") marine simulation.

Version 4.2.9

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- * **Mesh and Geometry:** Add options to keep biggest volume or combine all the volumes when multiple volumes generated during meshing
- * **Mesh and Geometry:** Add option to automatically combine sub-features to regular boundary
- * **UI:** Make template mode/extended mode switch by a single click instead of multiple clicks for cases with more than one templates

Version 4.2.7

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- * **Post Processing:** Add user defined (in expression) plot variables. Move access to module specific integrals (ie. Valve displacement) to the corresponding modules.
- * **Solver:** Add parcel for particle with mass, and particles can be released in volume

Version 4.2.6

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- * **Post Processing:** animation frames can be saved in multiple PNG files
- * **Post Processing:** More output for particles from boundaries and volumes.

Version 4.2.5

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- * **Post Processing:** Add user specified number of colors for color map, display value for each color in the legends, and also added more color schemes for color map.

Version 4.2.4

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- * **Solver:** Add dp/dt output for user defined damage model
- * **Mesh and Geometry:** automatically detect Sheet metal CAD surface and recue to single layer surface

Version 4.2.3

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- * **UI:** New feature let user split CAD surfaces around mouse pointer into two groups with user specified parameters

- * **Mesh and Geometry:** Allow user set mesh name in project file for automatic mesh build when load project file.
- * **Template:** Add a new template "Vehicle" for simulation of automotive vehicle external and under-hood flow and thermal analysis

Version 4.2.1

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- * **Solver:** Implement directional resistance models, with one specified flow direction or two specified flow directions
- * **Template:** Crescent template: add the ability to use CAD surface as basis for remesh
- * **UI:** Add intermediate results saving for steady simulation
- * **Mesh and Geometry:** Add mouse selection to Geometrical Operations

Version 4.1.5

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- * **Solver:** Add vapor mass rate change model for cavitation
- * **Solver:** Improvement in turbulence model. Change wall turbulent dissipation calculation for $y^+ < y_{critical}$
- * **Solver:** Add pressure jump and fan models at interfaces
- * **Post Processing:** Add phase mass output for VOF model
- * **UI:** Add user defined (through expression) text labels (with/without variables) in graphics window
- * **UI:** Ask if user want to save the results, when user force a steady simulation to stop.
- * **UI:** Improve reading time of grid with big surfaces

Version 4.1.4

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- * **Mesh and Geometry:** Add mesh refinement zone defined using expression function of x, y, z for more complicated refinement zone shape.

Version 4.1.3

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- * **Solver:** Improved VOF multiphase heat/energy equation

Version 4.1.2

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- * **Post Processing:** Add more integral output for VOF multi-phase at interfaces
- * **UI:** Add user specified background color for graphic window

Version 4.0.4

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- * **Mesh and Geometry:** Change grid initial splitting so the binary tree mesh (general mesher) size can be adjusted almost continuously.
- * **Mesh and Geometry:** General mesher add relative size to global model size (all CAD surfaces) option in addition to selected CAD surfaces size
- * **Mesh and Geometry:** Automatically set (default) grid/volume name from common prefix of selected CAD surfaces
- * **Template:** scroll template improvement
- * **Template:** Valve Gap "full closure model" using user specified (radial) location, and add warning if closure not found.

Version 4.0
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