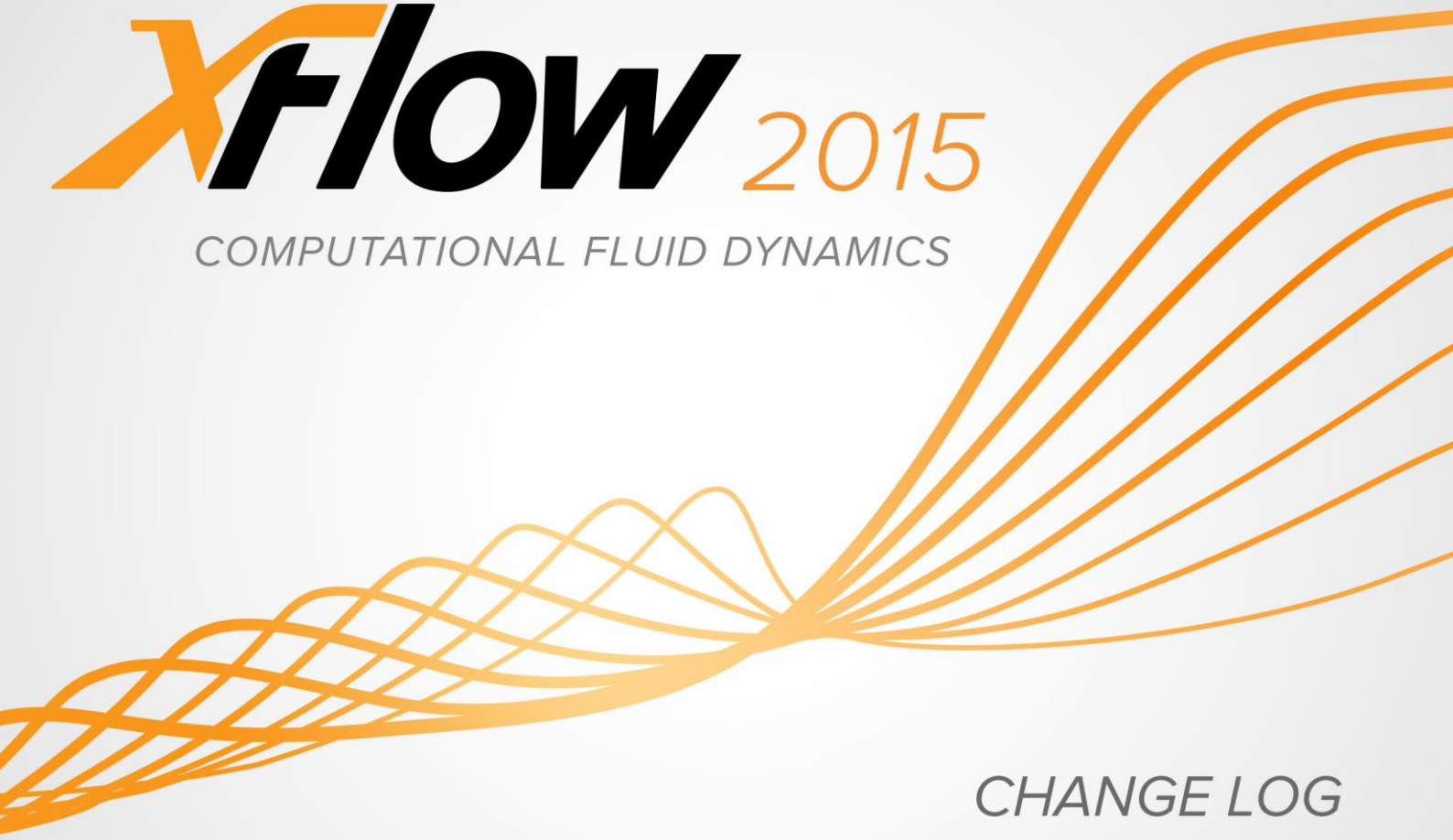
XFlow 2015

COMPUTATIONAL FLUID DYNAMICS



CHANGE LOG

NEXT LIMIT TECHNOLOGIES

Build 96 (released July 30, 2015)

- New feature: New data files structure based on HDF5 provides a more compact format (1 frame = 1 file)
- New feature: Refinement based on total pressure losses from a previous simulation
- New feature: Co-Simulation with MSC Nastran available for 3D simulations
- New feature: Low pass, high pass, band-pass, and band-stop filters available in the Function Viewer for signal processing
- New feature: Filtered static pressure field (low pass, high pass, band-pass, and band-stop) directly output from the engine
- New feature: Numerical data can be exported to an arbitrary lattice level frequency
- New feature: New wall lateral boundaries available for the virtual water channel
- New feature: Backflow phase can be defined in multiphase simulations
- New feature: Conjugate heat transfer workflow: solids can include thermal boundary conditions

- Improvement: Window functions and custom time range are now available for SPL and PSD
- Improvement: Free surface/Multiphase particle-based performance improvements
- Improvement: Memory scalability improvements
- Improvement: Extended number of harmonics in "Turbulence generation"
- Improvement: Projected fields over geometries can be exported in CGNS format
- Improvement: Permeability and Ergun coefficients are laws instead of constants for isotropic porous media
- Improvement: Custom fields can be exported in the XFlow surface data format from the Export Data window
- Improvement: Scalar fields can be exported from the Export Data window
- Improvement: LODI (non-reflecting) boundaries stability
- Improvement: Phase field inlet/outlet treatment

- Bug fix: Carreau Viscosity model wrong definition of alpha
- Bug fix: Minor issue when loading a project via file drag & drop
- Bug fix: Window functions and time range correctly applied
- Bug fix: Minor issues with refinement regions
- Bug fix: Resume function with moving geometries in MPI
- Bug fix: Automatic inertia tensor is automatically updated when changing CoG
- Bug fix: Rigid body dynamic geometries can have boundary conditions applied on surfaces
- Bug fix: Cancel button in the Export Data window
- Bug fix: Custom fields available with RMS data
- Bug fix: Phase field issue with external acceleration
- Bug fix: Temperature field correctly initialized from a previous simulation
- Bug fix: Minor geometry visualization issues
- Bug fix: Minor probes issues

Build 94 (released February 5, 2015)

- New feature: Two-way coupling with MSC.Nastran through OpenFSI available (Labs mode)
- New feature: FMI standard co-simulation available as slave (Labs mode)
- New feature: Absorbing inlet and outlet boundary conditions (LODI)
- New feature: Wake refinement distance control: stops refining beyond a given distance
- New feature: Non-passive scalar (species) transport
- New feature: Support resume file with rigid body dynamics
- New feature: Turbulent intensity can be specified at inlet for internal and generic rectangular domain simulations
- New feature: Cylinder and tubular refinement region
- New feature: Refinement shapes can be rotated
- New feature: Ability to create probes/sensors with mouse over the Graphic View
- New feature: Probes can be defined and move according to a reference frame or geometry
- New feature: Volume heat generation for porous volumes
- New feature: Export/Import a post-processing setup
- New feature: New data type: Root Mean Square (RMS) fields
- New feature: Post-processing tools for signal processing: Power Spectral Density (PSD) + filtering window functions
- New feature: Volumetric fields for free surface and fully compressible solvers can be directly output in CGNS format
- New feature: Averaged data available in CGNS format
- New feature: Fields to store can be controlled (enabled/disabled)
- New feature: Effective viscosity available as a new field
- New feature: Fluid forces in multiphase can output each phase contribution separately
- New feature: File “savedata-xflow” can be created to save intermediate solution between two frames
- New feature: Unload data button
- New feature: Probes exportation window allows to export a given range of probes, for the selected fields, and can be exported as separate files
- New feature: Isosurface are created from absolute field value
- New feature: Number of isocontours adjustable
- New feature: Discard narrow isolated fluid regions option, to remove the narrow fluid regions trapped between moving geometries
- New feature: Extract the force applied on joints
- New feature: Export joint positions
- New feature: Dynamic joint visualization
- New feature: Damping coefficient for cables
- New feature: The installer includes a silent mode to automate installation on HPC

- Improvement: Simulations with moving geometries up to 3x faster
- Improvement: Phase field multiphase solver robust even for high density ratios (liquid/gas)
- Improvement: Averaged and standard deviation data for passive scalar are saved
- Improvement: Stability improvements of external centrifugal forces scheme
- Improvement: The adaptive refinement applies correctly on porous volumes
- Improvement: Passive Scalar compatible with porous volumes
- Improvement: Accuracy of forces applied on porous volumes
- Improvement: Change the turbulence intensity to % instead of [0,1]
- Improvement: The VOF field is correctly initialized from other simulations for multiphase phase field model
- Improvement: Carreau model allows the Power law index "n" to be negative

- Improvement: Resume computation compatible with a simulation including Passive Scalar(s)
- Improvement: Include the field name, simulation time, and data type in the header of the surface field distribution data files
- Improvement: Fourier transform stability and performance
- Improvement: Surface mesh is shown with shading for clearer visibility
- Improvement: Change the "Export all" file format to be horizontal instead of vertical
- Improvement: The mass flow boundary condition now adapts the velocity to balance the density and pressure
- Improvement: Custom fields loading time is shorter
- Improvement: Moving geometries compatible with CGNS and Ensight formats
- Improvement: Add Vx, Vy, Vz for "XFlow surface data" in the data export menu

- Bug fix: Stability parameter initializes with a constant random value
- Bug fix: Phase field inlet/outlet boundary condition
- Bug fix: Issues when loading axis force distribution data in Linux
- Bug fix: Function using the variable u(x,y,z) now works free surface and segregated energy
- Bug fix: vmod variable is not available in the custom field law with averaged data
- Bug fix: Minor issue with stability parameter output in logs and function viewer
- Bug fix: The buffer zone length and refinement transition length do not apply when using refinement regions
- Bug fix: Sphere regions crossing rectangular regions
- Bug fix: Periodicity boundary condition compatible with MPI
- Bug fix: Anisotropic porous volume issues
- Bug fix: Passive scalar diffusivity is correctly applied
- Bug fix: The predefined views or dimensions measurement do not rescale after importing a geometry in different units than meters or rescaling a geometry
- Bug fix: The sign of moments is inversed when changing of Reference Frame
- Bug fix: Remove color code in the shape name of the imported geometries
- Bug fix: Post-processing issues with free surface sloshing simulations
- Bug fix: Probes read zero-values if too close from the walls
- Bug fix: Density value of Conjugate Heat Transfer geometry is saved correctly
- Bug fix: The default folder when exporting surface field distribution is now as specified in the Preferences
- Bug fix: Export Data not showing the correct directory when pressing Browse
- Bug fix: The “Export all” function works for several plot lines
- Bug fix: Exporting data file from the Function Viewer in Linux is now saved with extension .txt
- Bug fix: Groups of probes are numbered from 0 instead of 1
- Bug fix: Surface field distribution data is exported with filename numbered from 0 instead of 1
- Bug fix: Issues when loading surface data (Y+, etc.) of moving geometry simulation run in MPI
- Bug fix: Load data fails when a serial computation is made from a project file used to run an MPI
- Bug fix: Minor issues with the process manager queue

Build 92 (released June 4, 2014)

- New: Possibility to add a resolution on a specific surface of a geometry
- New: Shell elements selection and boundary condition application
- New: Parametric hierarchy information
- New: “Analysis type” parameter to set External/Internal simulations independently from the flow model
- New: Additional option in the Preferences to check the new XFlow versions available
- New: Expert mode for advanced users
- New: Exportation to CGNS format directly from the engine or converted from XFlow format
- New: Data exportation to Ensight Gold, Paraview and CGNS format accessible via command lines for a better automation of the post-processing
- New: Export surface data with mesh connectivity
- New: Export surface pressure map to ABAQUS format
- New: Force distribution and cumulation along geometries in axis directions
- New: Custom reference frame to output forces and moments in arbitrary reference axis
- New: Cyclic DPM capability to loop on a frame range
- New: Reference length available for Turbulence generation scale and Wall function time filter
- New: Refractive index for acoustics analysis
- New: Wall function time filter (available at Labs)
- New: Reference pressure point (available at Labs)
- New: Multiphase phase field solver (available at Labs)
- New: Optimization options available for advanced MPI load balance control
- New: Simulations can be initialized from MPI simulation data
- New: MPI to serial data converter integrated to the engine to unify data format
- New: Automatic launch script template generation to execute computations in command lines

- Improvement: Engine performance up to 20% faster
- Improvement: Domain generator memory usage lowered by 15%
- Improvement: MPI computations can be resumed
- Improvement: The “Generate binary files” with “Automatic” initial conditions generates binaries for the several passes
- Improvement: Advanced computation wizard simplified and reviewed
- Improvement: Advanced computation wizard now allows to generate the domain remotely
- Improvement: Simulation launched via the Advanced computation wizard are killed using an exit-xflow file
- Improvement: Acoustics analysis is available with free surface flow model
- Improvement: Acoustics analysis adjusts automatically the frames frequency and the time step in order to ensure the correct speed of sound
- Improvement: Segregated energy compatibility with free surface and multiphase flows (interface treatment and thermal properties application)
- Improvement: Segregated energy compatibility with conjugate heat transfer solids and free surface/multiphase flows
- Improvement: Segregated energy compatibility with porous media compatibility
- Improvement: Multiphase fluids properties are fully editable for both fluids
- Improvement: Constants do not allow commas anymore (decimals are marked by points)
- Improvement: Temperature is now supported in the laws (input laws, custom fields, etc.)
- Improvement: Project tree organization improvements (Engine, Materials, Simulation)
- Improvement: Inconsistent options dependencies are disabled
- Improvement: Generate domain logs review
- Improvement: Review of the fully compressible output logs

- Improvement: Additional warning are introduced in the logs (no reference velocity defined, etc.)
- Improvement: Stability parameter definition takes into account the pressure gradients for better stability control
- Improvement: Resume computation is no longer available if the resume file is not saved
- Improvement: Data file structure reviewed and more compact
- Improvement: STL geometries importation efficiency
- Improvement: The surface field distribution on cutting planes work even for arbitrary planes that are not axis-aligned
- Improvement: Additional “Export all” functions in the Function Viewer for quicker post-processing
- Improvement: Better DPM support for moving parts
- Improvement: Surface integral sampling on non-uniform mesh

- Bug fix: Several shapes can be imported at once in the browse window
- Bug fix: STL imported from CATIA are correctly named
- Bug fix: Gizmos mouse and edit box transformations do not add up anymore
- Bug fix: Unrequested selection mode switch
- Bug fix: Instability on hierarchy face selection
- Bug fix: Low mass handling in Rigid body dynamics
- Bug fix: Microscopic geometries now work with enforced behavior
- Bug fix: Scientific notation is supported in laws
- Bug fix: Remote computation using tabular data are now working since tabular data files are copied with binary files in the working directory
- Bug fix: The “Generate binary files” option now also generates the .xfk file
- Bug fix: All project tree options are now correctly saved in the binary files
- Bug fix: Minor loading issues with MPI post-processing
- Bug fix: Minor issues with Rigid body dynamics in MPI
- Bug fix: Reference area is now correctly estimated when no geometry is present in the wind tunnel
- Bug fix: Bulk viscosity minor issue
- Bug fix: Heat flux dimension and surface area estimation
- Bug fix: Minor issue on energy conservation for free surface flows with segregated energy
- Bug fix: Conjugate heat transfer issues on heat capacity
- Bug fix: Multiphase particle-based tracking mass conservation issues
- Bug fix: Issue on sloshing free surface
- Bug fix: Custom fields importation in Ensight Gold
- Bug fix: Cutting planes now plot temperature inside Conjugate heat transfer geometries
- Bug fix: Cutting plane refresh on field change
- Bug fix: Color bar refresh on Surface info
- Bug fix: Warning message on isosurfaces holes removed
- Bug fix: Volumetric rendering minor issues in internal simulations
- Bug fix: Stream tracer leaving internal domain
- Bug fix: Issue on several plot lines refresh
- Bug fix: Pressure integrals units displayed in Function Viewer
- Bug fix: Stream tracer for MPI simulations
- Bug fix: Surface info (Y+, Cp, Cf, LIC) for MPI simulations
- Bug fix: Probe temperature with MPI simulations