

# Conifer Cast 3.0

## New features

- User interface improvements
- Easier modeling of cooling channels
- Solid object heat transfer improvements
- Metal inputs replaces feeding obstacles
- Moving obstacles, centrifugal casting improvements
- Postprocessing improvements
- Miscellaneous
- User manual improvements

# User interface improvements 1/2

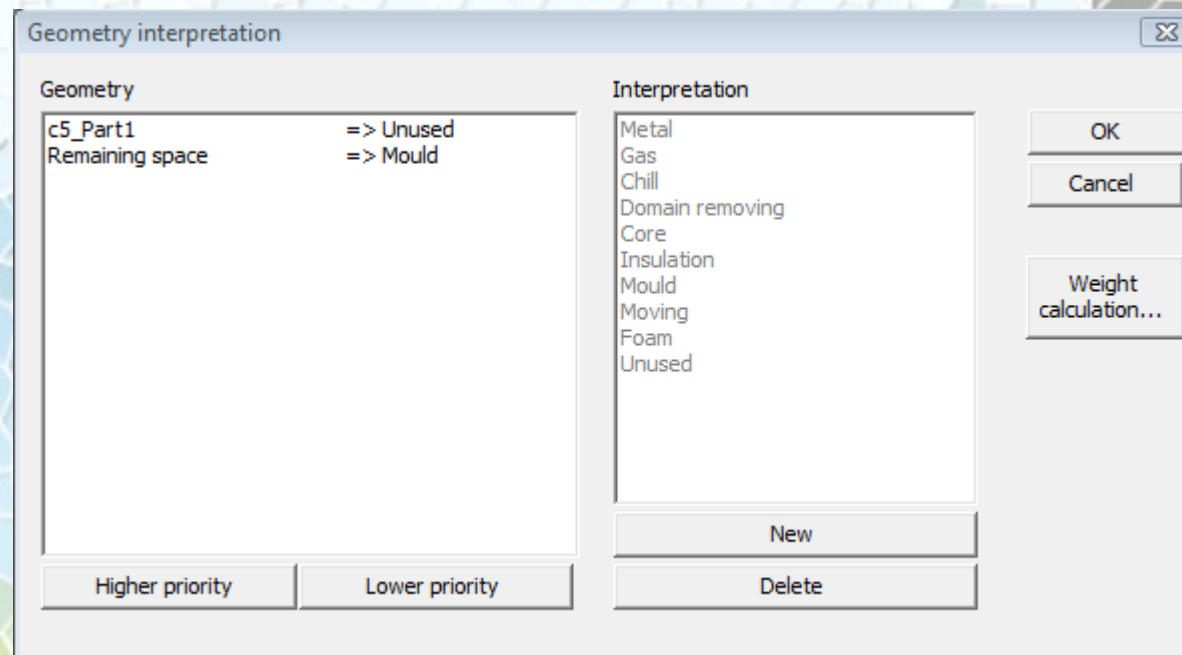
## General user interface changes

- ◆ More clear and consistent
  - ◆ Reducing ambiguities where same parameter was set in several places
  - ◆ Removed some unnecessary steps to make using smoother
- ◆ Major changes to locations where some parameters are defined
  - ◆ Source parameters replaced with solid objects and metal inputs dialogs
  - ◆ General parameters replaced with metal parameters and gas parameters
  - ◆ In menu's, added new entry: gas region parameters
  - ◆ Numeric options moved away from the toolbar, heat transfer coefficients moved to toolbar

# User interface improvements 1/2

Reworked geometry interpretation dialog

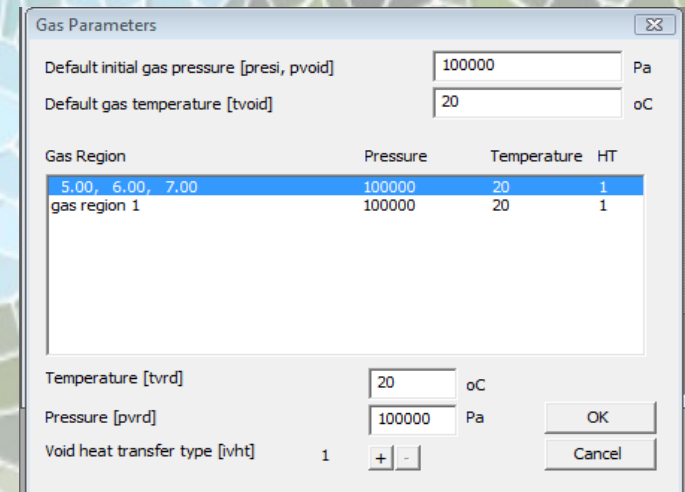
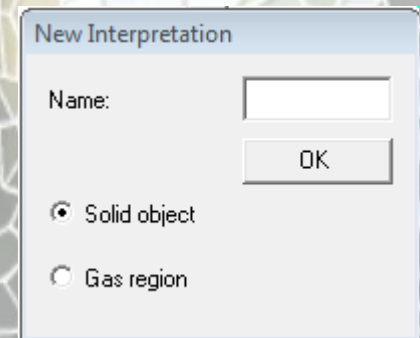
- ◆ To make user interface more logical
- ◆ To speed up this very common procedure



# Easier modeling of cooling channels

Defining cooling channels as void regions without region pointers

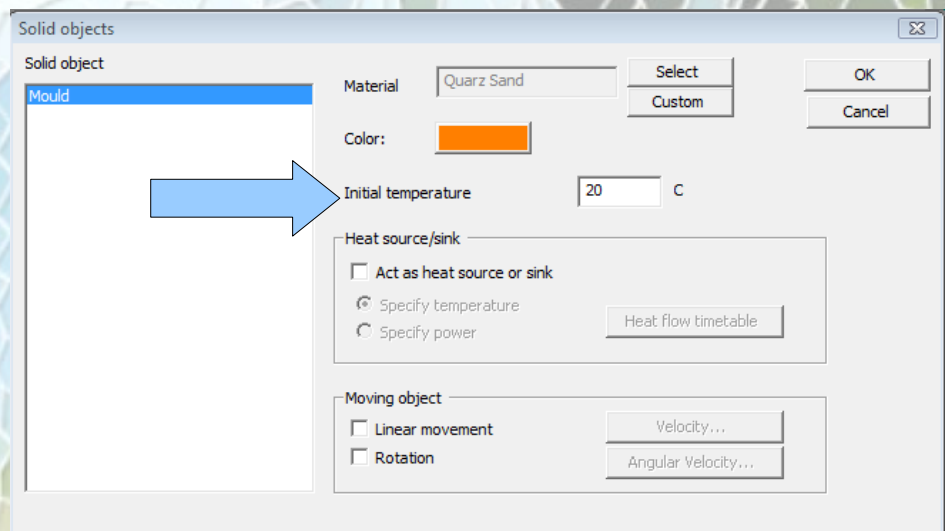
- ◆ Model the cooling channel as an STL
- ◆ In geometry representation generate a new gas region for the cooling channel and assign the STL to it
- ◆ In gas parameters (new!) define temperature for the cooling channel
- ◆ In heat transfer coefficients set the time dependent (new!) heat transfer coefficient for the gas region



# Solid object heat transfer improvements

Setting different initial temperatures for different obstacles

- ◆ Model the parts of mould etc. With different initial temperature as separate STLs
- ◆ Give the STLs different interpretation in geometry interpretation
- ◆ In solid objects dialog now allows specifying different initial temperature for different parts of mould.



# Metal inputs replaces feeding obstacles 1/2

Mass/momentum sources as metal input

- Previously the metal input had to be defined either as border condition at the edge of mesh or as an obstacle into which the metal will appear
- New mechanism of metal inputs replaces the obstacle based metal inputs used before
- Metal input is defined as two dimensional profile in the simulation domain. The metal will appear through this profile into the system

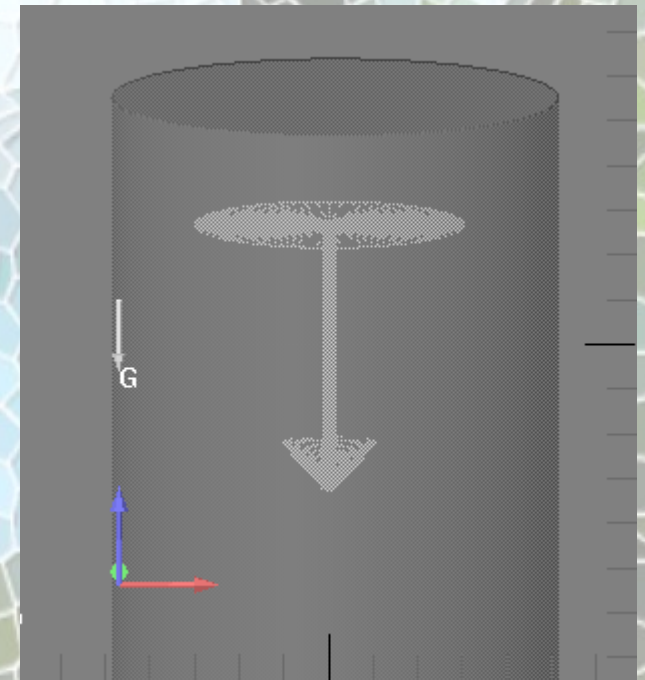
The screenshot shows a software dialog box titled "Metal inputs". At the top, there is a list of "Metal inputs" with "Metal Input" selected. To the right of the list are "New" and "Delete" buttons. Below the list is a section titled "Metal source details" containing several input fields:

- Name:** Metal Input
- Location:** X: 0, Y: 0, Z: 0
- Profile radius:** 30 mm
- Metal flow direction vector:** X: 0, Y: 0, Z: -1
- Flow rate:** 0 m3/s /Time

At the bottom of the dialog are "OK" and "Cancel" buttons.

# Metal inputs replaces feeding obstacles 2/2

- ◆ Metal input can be positioned and rotated freely in the simulation domain
- ◆ Metal inputs are visualized on screen as a profile and an arrow indicating the direction of incoming metal flow



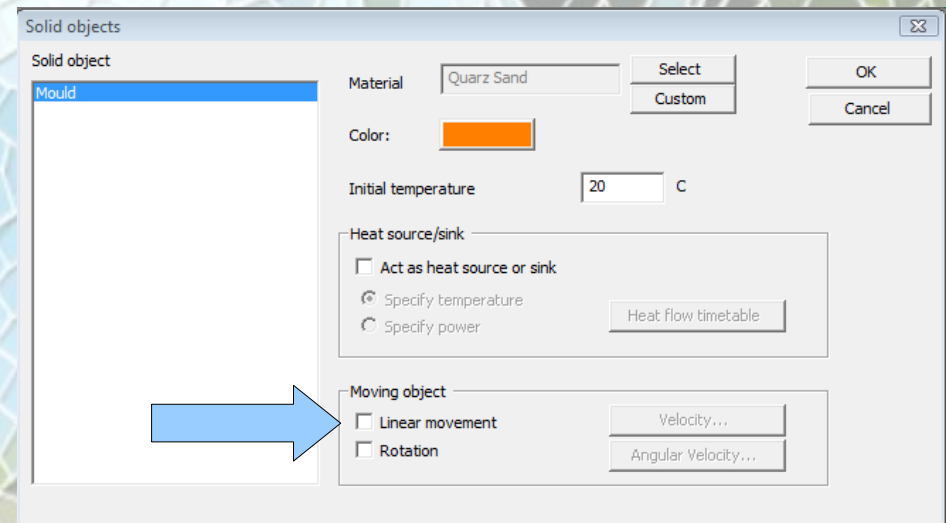
# Moving obstacles, centrifugal casting improvements

Improved support for moving obstacles

- Using newer GMO model of FLOW-3D

Improved support for centrifugal castings

- Support for rotating obstacles

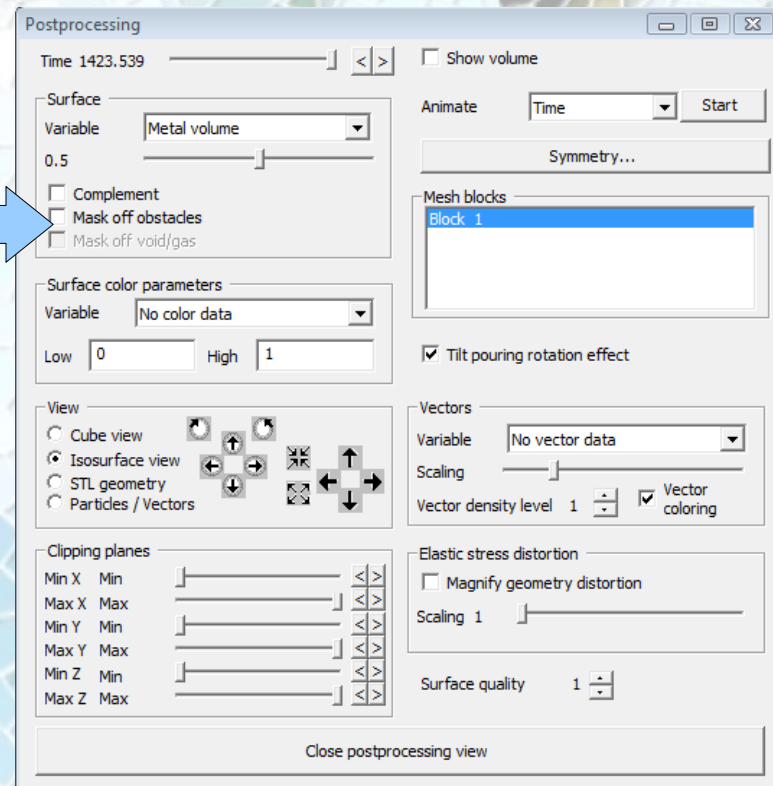




# Postprocessing improvements 1/3

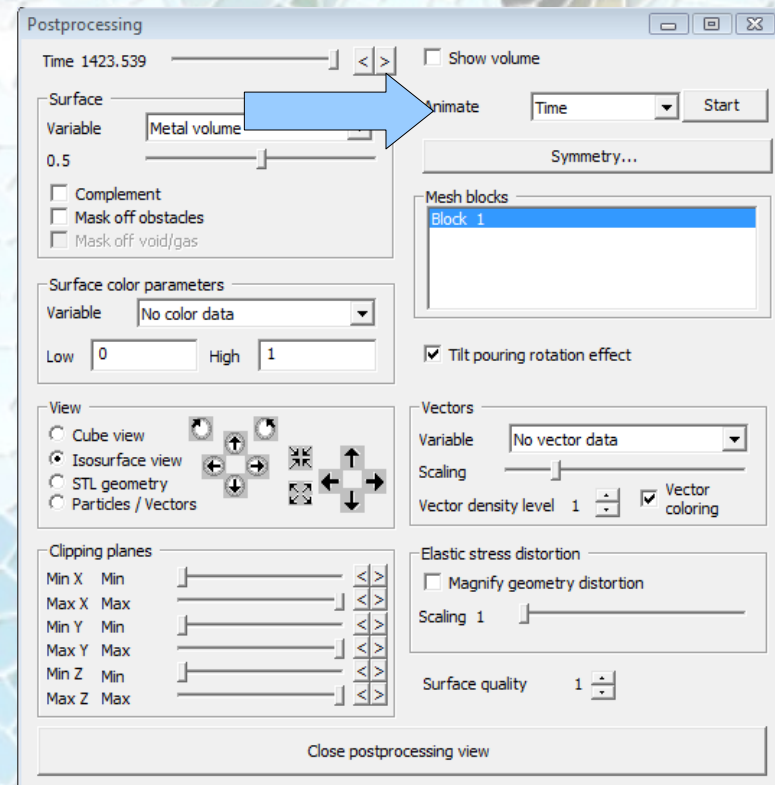
## Postprocessing changes

- Masking off gas/void
- Masking off obstacles automatically for variables that are not defined for obstacles
- Masking off metal automatically for variables that are not defined for metal



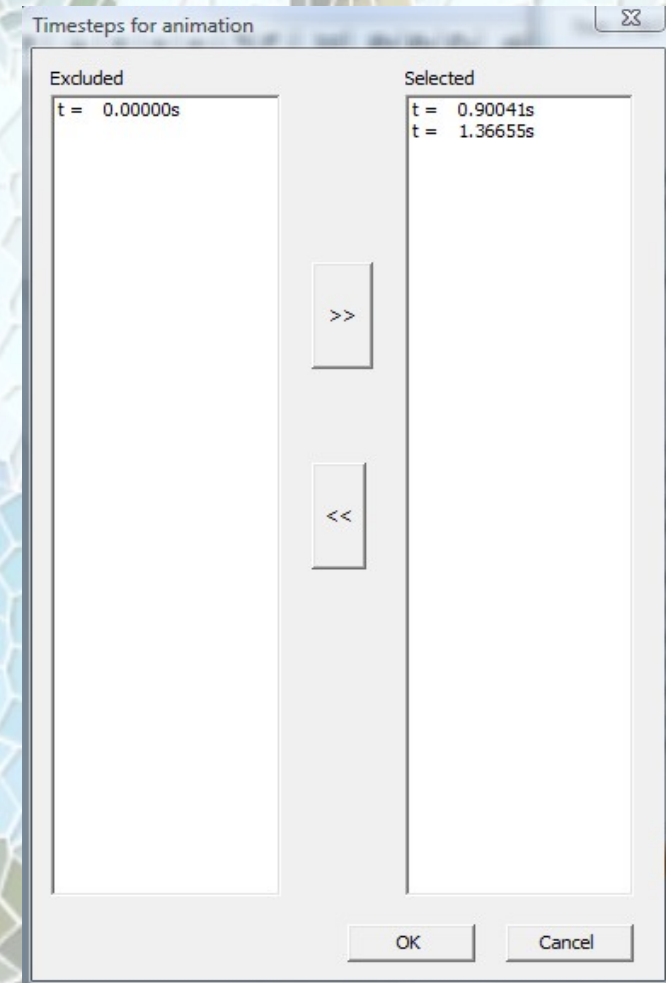
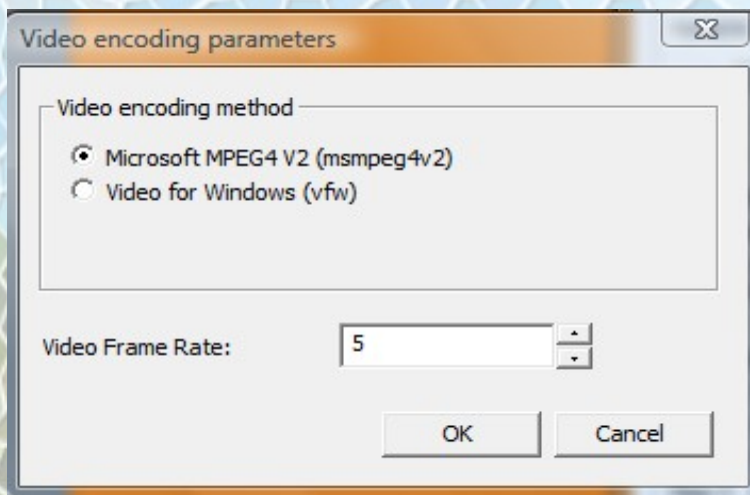
# Postprocessing improvements 2/3

- Creating geometry "slicing" videos/animation
- Animating time or slicing on screen (without creating a video)
- Showing both mould temperature and metal temperature in same view (new variable 'Temperature').



# Postprocessing improvements 3/3

- ◆ Selecting subset of timesteps for animation
- ◆ Support for encoding mpeg4 videos without installing any codecs to system => smaller videos sizes



# Miscellaneous 1/2

Joining multiple SPF:s into one for postprocessing

- ◆ Until now postprocessing simulations that were run in several parts (using restart runs) was problematic. Each part had to be postprocessed separately.
- ◆ Conifer Cast 3.0 allows merging results of a simulation and it's restart run.
- ◆ Meshing, settings etc can be changed normally at restart points
- ◆ A simulation can be run in several parts, each continued with restart runs, and then combined into one result set and postprocessed as one simulation

# Miscellaneous 2/2

## Importing/Exporting data in text format

- ◆ Exporting selected data on selected timesteps in text format
- ◆ Importing data for postprocessing in text format
- ◆ Allows making custom tools that calculate special criteria functions from data exported from Conifer Cast and then using Conifer Cast to postprocess the results of such custom tool

## Solver upgraded to FLOW-3D 9.2.1

- ◆ Reliability improvements
- ◆ Bug fixes

# User manual improvements

## User manual improvements

- ◆ Improved explanations on many occasions
- ◆ Added howto on
  - ◆ Meshing
  - ◆ Modeling feeding
  - ◆ Modeling feeding
  - ◆ Centrifugal casting
  - ◆ Lost foam process
  - ◆ + more