

# 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

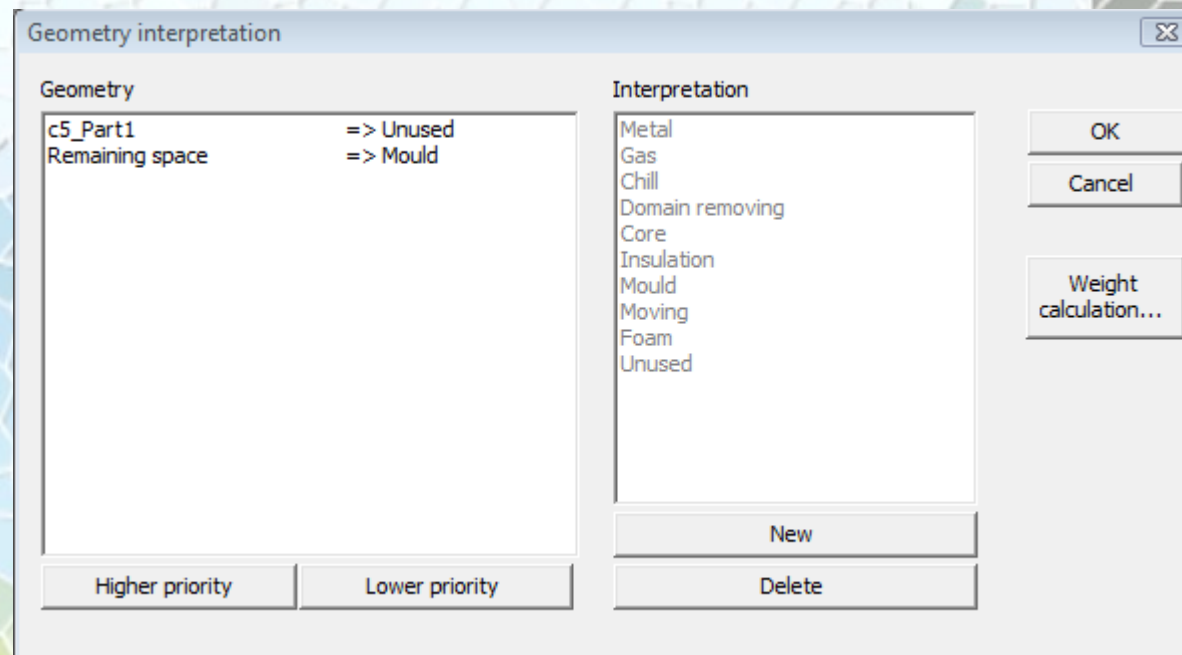
## General user interface changes

- ◆ 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

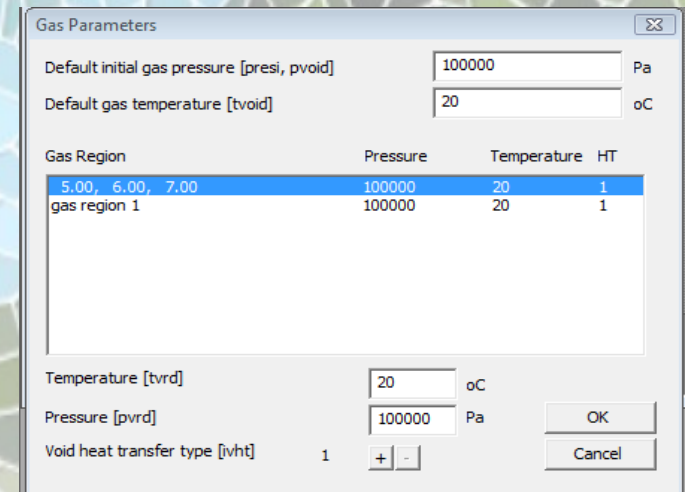
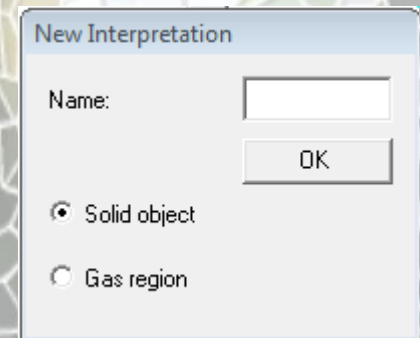
- ◆ To make user interface more logical
- ◆ To speed up this very common procedure



# Easier modeling of cooling channels

Defining cooling channels as void regions without region pointers

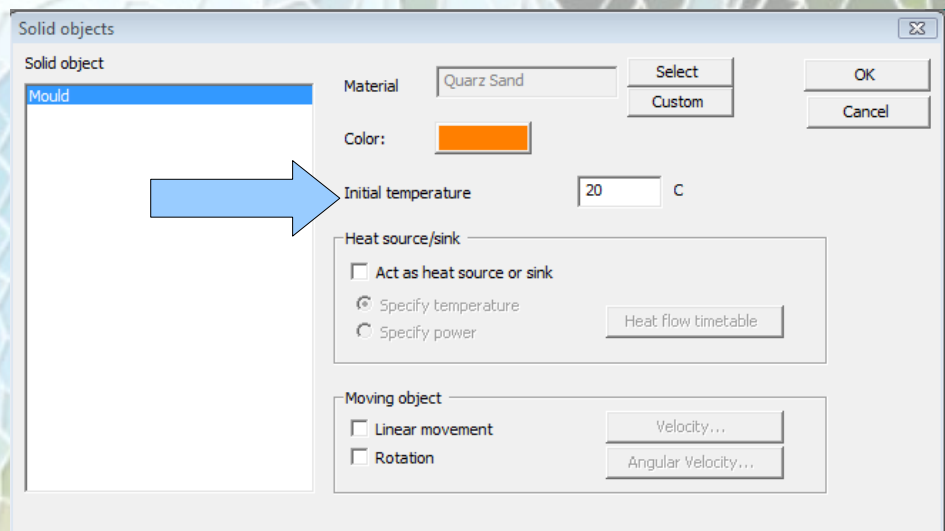
- ◆ Model the cooling channel as an STL
- ◆ In geometry representation generate a new gas region for the cooling channel and assign the STL to it
- ◆ In gas parameters (new!) define temperature for the cooling channel
- ◆ In heat transfer coefficients set the time dependent (new!) heat transfer coefficient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



# Solid object heat transfer improvements

Setting different initial temperatures for different obstacles

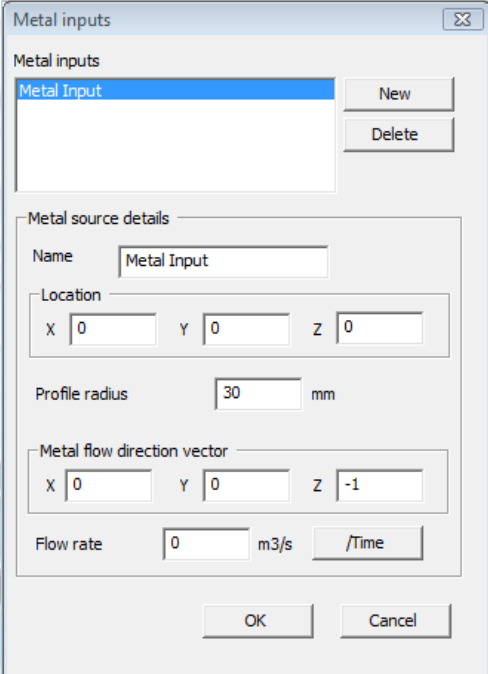
- ◆ Model the parts of mould etc. With different initial temperature as separate STLs
- ◆ Give the STLs different interpretation in geometry interpretation
- ◆ In solid objects dialog now allows specifying different initial temperature for different parts of mould.



# 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



Metal inputs

Metal inputs

Metal Input

New

Delete

Metal source details

Name Metal Input

Location

X 0 Y 0 Z 0

Profile radius 30 mm

Metal flow direction vector

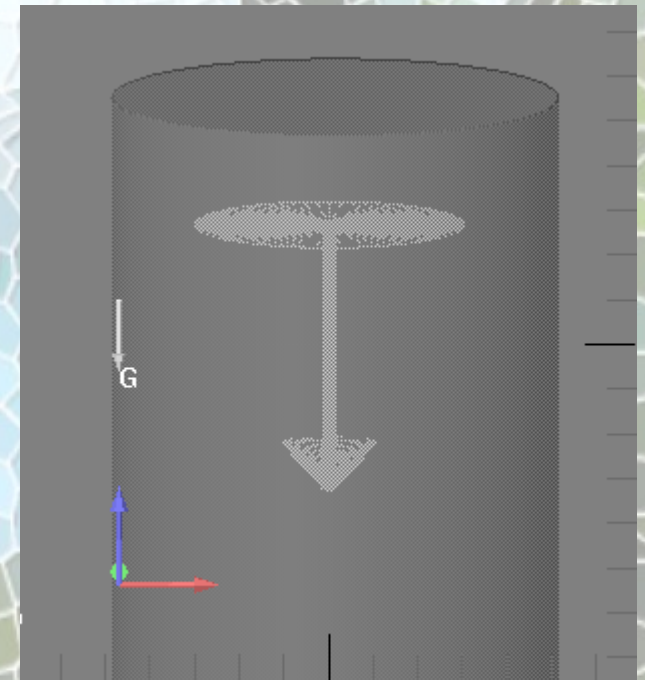
X 0 Y 0 Z -1

Flow rate 0 m3/s /Time

OK Cancel

# 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



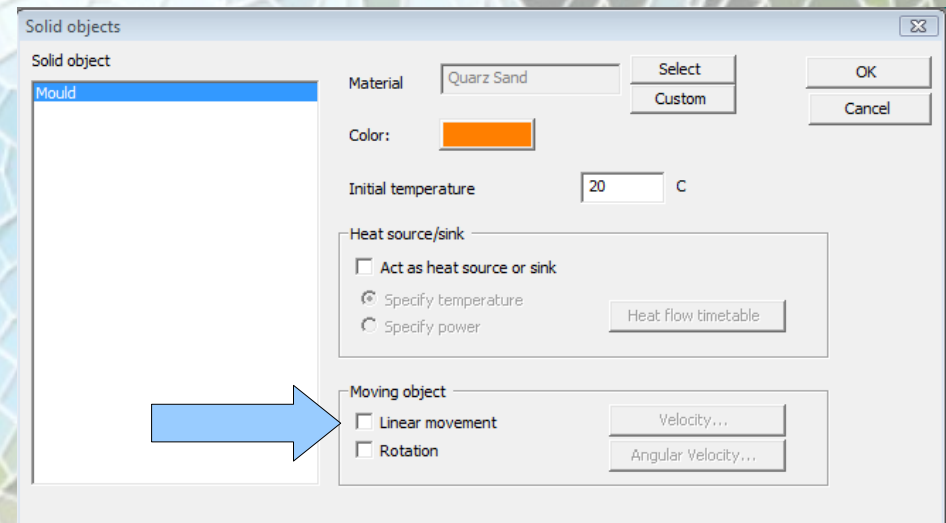
# Moving obstacles, centrifugal casting improvements

Improved support for moving obstacles

- Using newer GMO model of FLOW-3D

Improved support for centrifugal castings

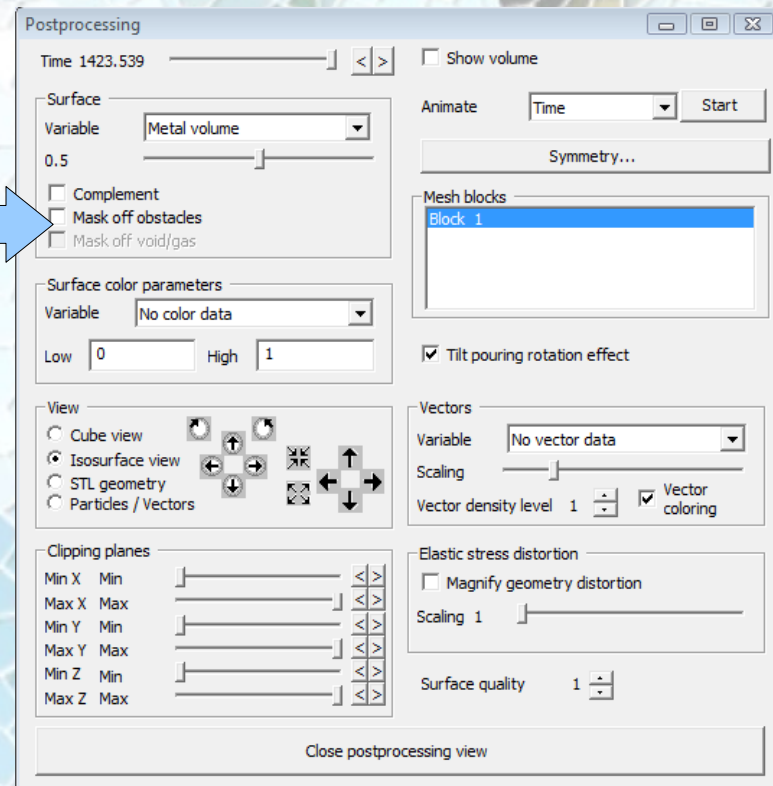
- Support for rotating obstacles



# Postprocessing improvements 1/3

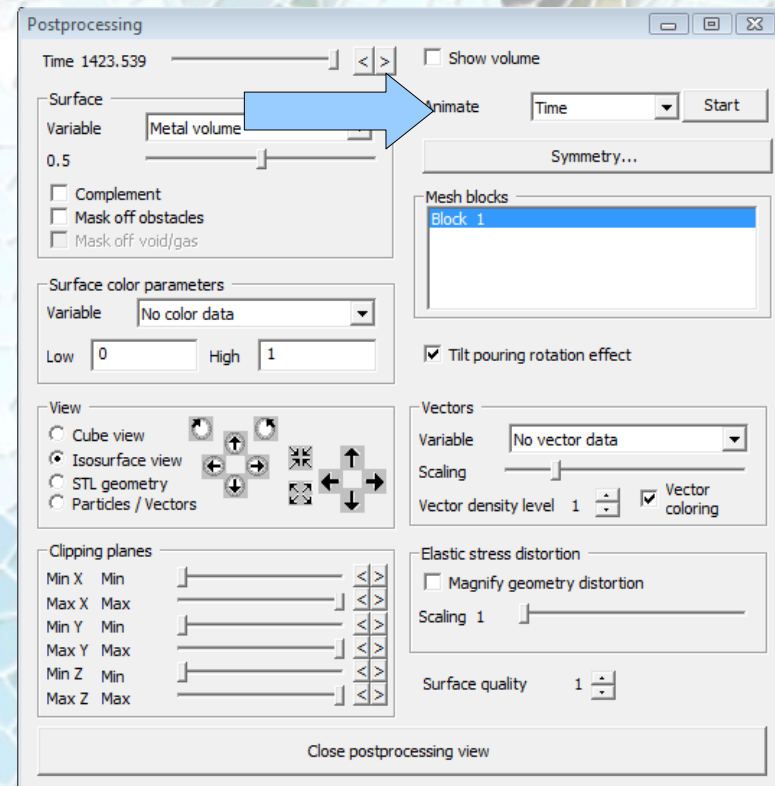
## Postprocessing changes

- 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



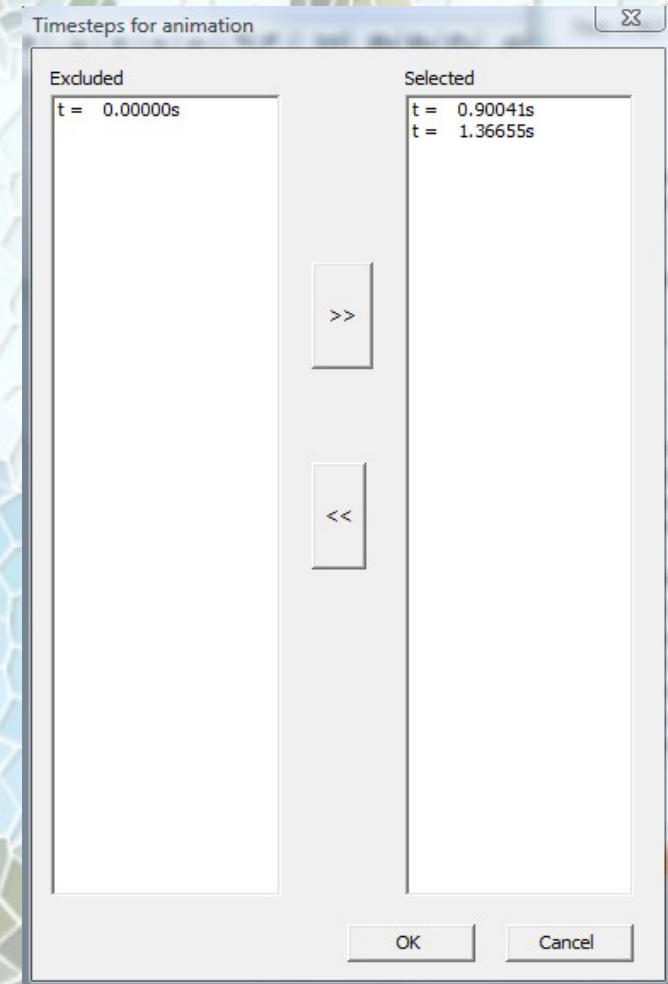
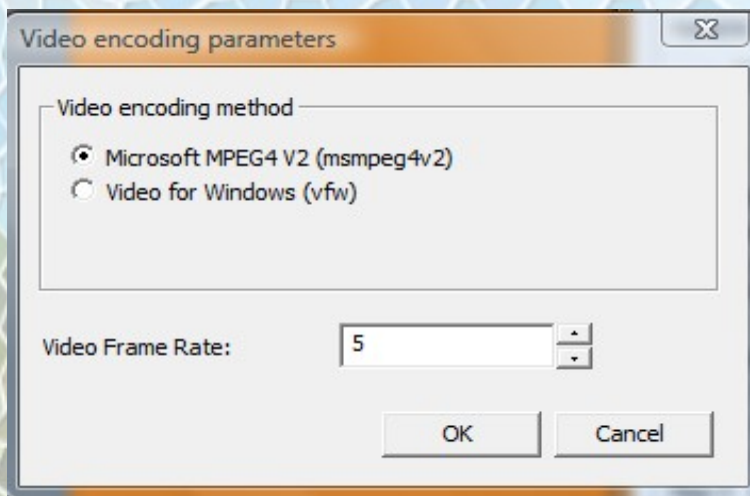
# Postprocessing improvements 2/3

- 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