

15<sup>th</sup> November 2019

Dear scFLOW Customers,

## **scFLOW Version 2020 Release Notes**

Software Cradle is proud to announce the release of scFLOW Version 2020, a part of the comprehensive suite of virtual product development from MSC Software.

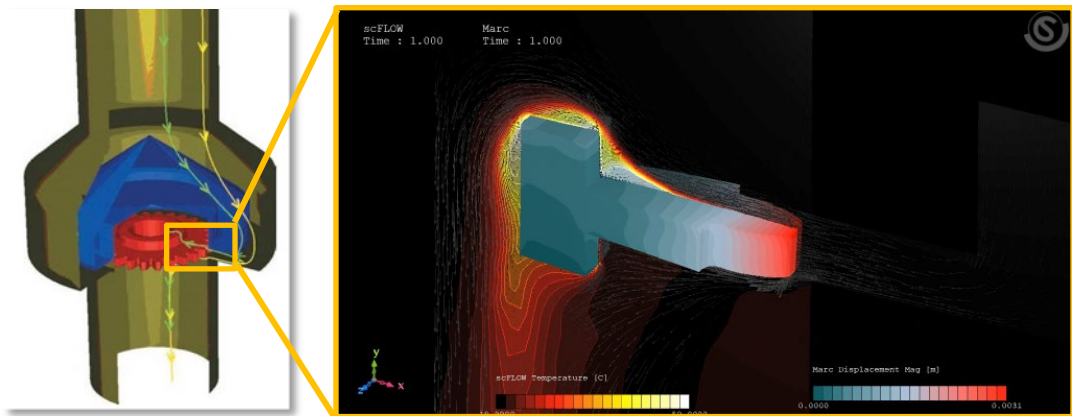
Below is the detail of what's new to scFLOW. For more information, visit our Users Page.

We trust you are now familiar with your software package and the supporting aids and services available to you and thank you for the investment you have made in our virtual product development from MSC Software.

### **1. Co-Simulation**

#### ■ **Compatible with heat and liquid**

scFLOW V2020 supports thermal analysis in Co-Simulation with MSC Nastran and Marc. Coupled liquid-elastic body analysis can also be performed which was once difficult in terms of analysis stability. This will further expand the multi-physics analysis domain.



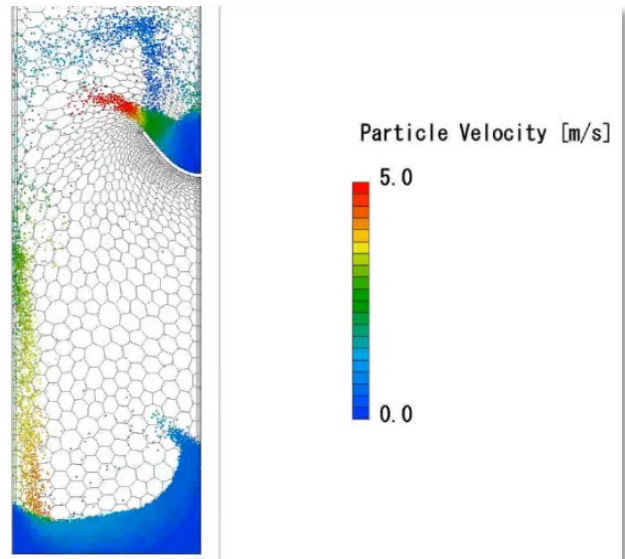
Heat flow & stress displacement analysis by Co-Simulation with scFLOW and MSC Marc

### **2. DEM-CFD**

#### ■ **DEM (Discrete Element Method) implementation**

DEM function has been added to scFLOW. Contact and sedimentation of particles can be considered. DEM-CFD analysis is possible solely within scFLOW, without a need of coupling with external DEM software. Co-Simulation with MSC Nastran, Marc, and Adams is also available.

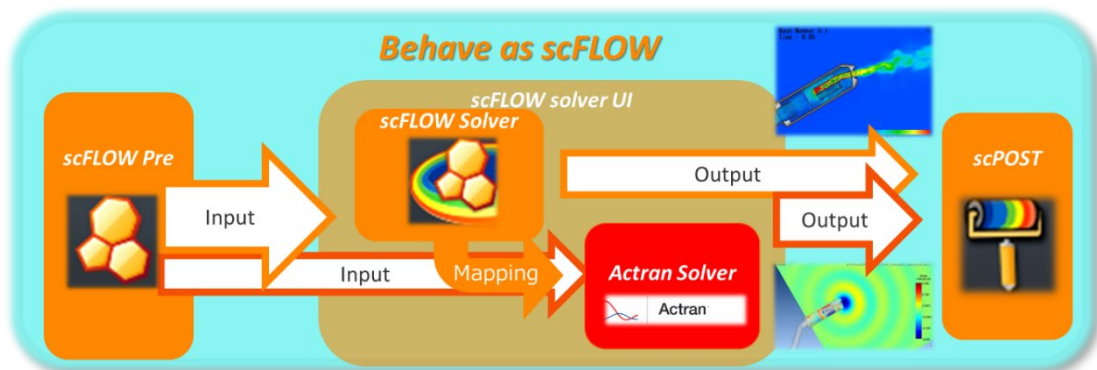
Behavior of particle & spring plate  
in Co-Simulation with  
scFLOW DEM & MSC Nastran



### 3. Aero-acoustics in Cradle CFD (powered by MSC Actran )

#### ■ Embedded aero-acoustics thanks to scFLOW2Actran

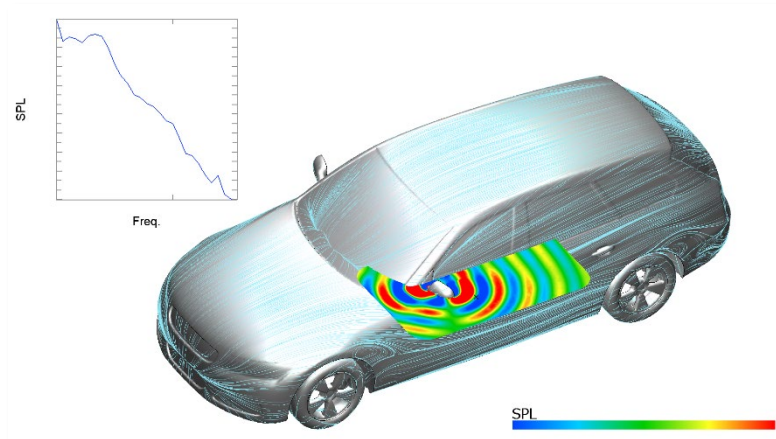
Perform MSC Actran's aeroacoustics analysis within the scFLOW's User Interface, from making analysis settings to generating mesh. The once-independent GUI will automate troublesome tasks such as mapping of the data of a transient analysis.



### 4. Visualization solution with scFLOW Postprocessor and MSC products

#### ■ Enhanced interface integration with scFLOW Postprocessor and MSC products

The calculation results from MSC Nastran, Marc, Adams, Actran can be visualized in scFLOW Postprocessor. The results obtained from Co-Simulation can be displayed in a common draw window, enabling a precise qualitative and quantitative assessment.

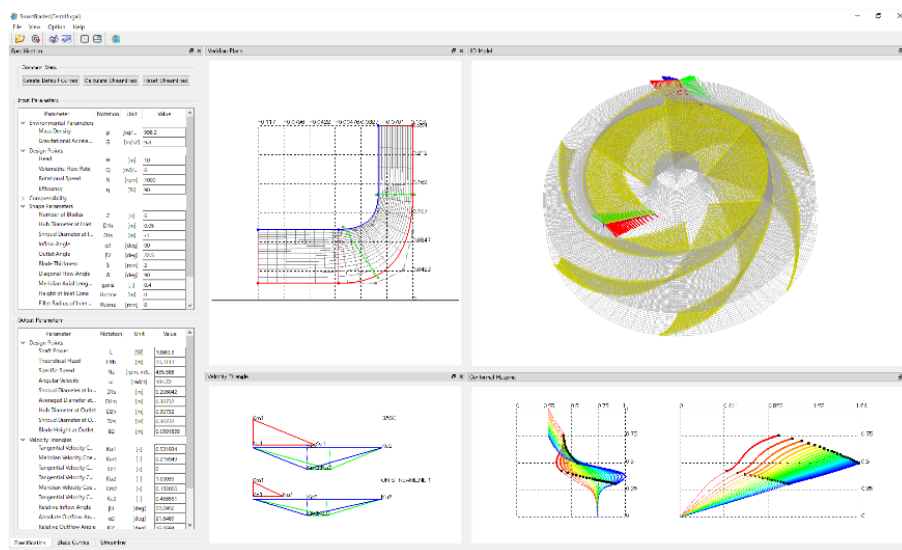


Visualizations of CAA results of the side mirror by MSC Actran on scFLOWpost

## 5. SmartBlades (Centrifugal)

### ■ SmartBlades for impellers of centrifugal- or diagonal-type

A new blade generation tool has been added to SmartBlades, primarily for centrifugal and diagonal impellers. Create a 3D blade geometry by entering the required specifications including the head, flow rate, and rotation speed.



GUI of SmartBlades (Centrifugal)

## 6. New Cavitation Model

### ■ Multi-process cavitation model

In a collaborative effort with Pr. Tsuda of Kyushu University, this model enables to obtain detailed information that cannot be captured by conventional cavitation models. This allows to predict phenomena such as pressure pulses and cavitation noise.

[Additional detailed information]

- Mean bubble number density
- Mean bubble diameter
- Mean internal pressure of bubbles
- Bubble coalescence & collapse



Cavitation generated around screw propeller  
(Volume rendered by bubble radius)

If there are any questions, please contact Cradle or MSC Software Customer Support or your local representative for assistance.

**Inquiry**

For any inquiries regarding this notice, please contact us at:

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