

- 1 Combined CFD and CSM views
- 2 Starting the FSI Mapper Plugin
- 3 + 4 FSI Mapper Panels

FSI MAPPING PLUGIN FOR ENSIGHT

Need for Mapping Solutions

In many engineering applications it is necessary to transfer simulation results from one model to another. Such examples are thermal loads on structures or fluid forces on deformable components.

On the other hand simulation tools in CFD and CSM have their own discretization, preferred element types and mesh densities. Mapping solutions thus have to work with incompatible models on source and target side.

General Features

EnSight is one of the most widespread postprocessors for interactive visualization of simulation results. In teamwork with CEI, SCAI has integrated its multiphysics mapping library »MapLib« as a plugin solution for the EnSight tool. The effort made use of the Python programming interface and

the open file format EnSight Gold. The engineer can use EnSight interactively to select the areas for data transfer, to define the coupling quantities and to specify the numerical mapping parameters. Finally, the user can view in parallel the distribution of values on the source model and the mapped quantities on the target.

Easy of Use

The use of the EnSight-FSI-plugin to map CFD results onto a CSM model is straight forward:

1. Import a source model and result
2. Import a target model as additional case
3. Open FSI-plugin dialog
 - Select source and target parts
 - Select quantities and time steps
 - Define mapping parameters
 - Select solver output format
 - Start mapping procedure
4. View mapped target data

Fraunhofer Institute for Algorithms and Scientific Computing SCAI

Schloss Birlinghoven
53754 Sankt Augustin, Germany

Contact

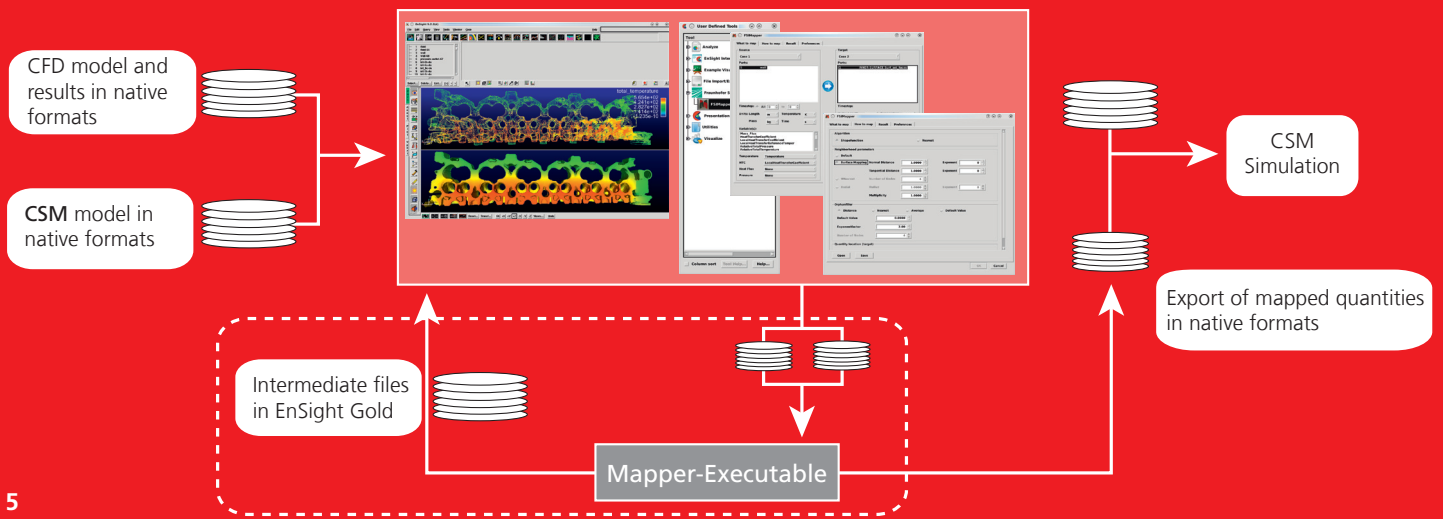
Klaus Wolf
Phone +49 2241 14-2557
mpcci@scai.fraunhofer.de
www.mpcci.de

Distribution

scapos AG
Phone +49 2241 14-2819
www.scapos.com

www.scai.fraunhofer.de





5 Internal work- and dataflow of the FSI-plugin.

Technical Solution

The FSI-plugin uses the EnSight Python interface to communicate with the active EnSight tool. The model definition of the selected parts and the quantity values located on these parts are exported to intermediate files in EnSight Gold format.

The mapper plugin uses these intermediate files and creates a new EnSight Gold file for the generated target data. This target case file then is automatically imported into EnSight and presented in a third viewing panel.

The mapper executable also can be used as a stand-alone batch tool in workflows.

Multiphysics at Fraunhofer SCAI

Fraunhofer SCAI has developed various tools and solutions for multidisciplinary engineering. MpCCI is the leading and open interface to couple simulation codes from different vendors in one single application. There are dedicated solutions for a seamless data transfer in manufacturing process chains (e. g. metal forming workflows) as well as code independent FSI mapping tools. Finally, the generic C++ based mapping library »MapLib« can be integrated into your own CAE application code.

SCAI also has developed the FEMZIP compression tool which can reduce the size of simulation result files drastically.

Importing CFD Results

EnSight supports an extraordinary number of common data formats and interfaces to various solvers' native result formats. Additionally lots of codes can export to the EnSight Gold format. Please check the information at

www.ensight.com/Data-Interfaces/interfaces.html

to get latest details on supported file formats.

Export to CSM Model Files

The FSI-plugin provides a direct export of mapped quantity fields to native file formats.

Abaqus input deck (*.inp)

- Filmtemperature
- Heat transfer coefficient
- Heat flux
- Pressure

Nastran bulk data (*.bdf)

- Temperature
- Pressure

Product Availability

A version of the FSI-plugin for EnSight 9.2.2 will be available in October 2011. Support for EnSight 10 is planned for December 2011.

About CEI Company

Computational Engineering International (CEI) develops cutting-edge post-processing, visualization and animation software. CEI's flagship product is EnSight. EnSight is available in versions running from laptops to supercomputers. There is a suitable version for a wide variety of needs.

CEI was founded in 1994, 2009 was the 15 year anniversary, and strives to continually provide newer, increasingly powerful and more accessible solutions for many different industries. They are a privately held organization with steady fiscal growth boasting more than 700 customers and 1,500 software seats worldwide.

