

MAPPING THERMAL LOADS FROM FLOTHERM TO FEA

Fraunhofer Institute for Algorithms and Scientific Computing SCAI

Schloss Birlinghoven
53754 Sankt Augustin, Germany

Contact

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

Sales

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

www.scai.fraunhofer.de

The FSIMapper provides advanced and robust interpolation methods to transfer cell temperature values from FloTHERM onto an arbitrary mesh in Abaqus, ANSYS or MSC.Nastran.

A new feature in FloTHERM 10 enables the export of temperature data to be used as thermal loads in a mechanical stress simulation.

Working with incompatible geometries

Computational fluid dynamics and finite element analysis and FEA usually have incompatible mesh discretizations and even non-matching geometry details. The FSI Mapper can handle such nonmatching model definitions – robust mapping and extrapolation methods will provide valuable results even for crucial cases.

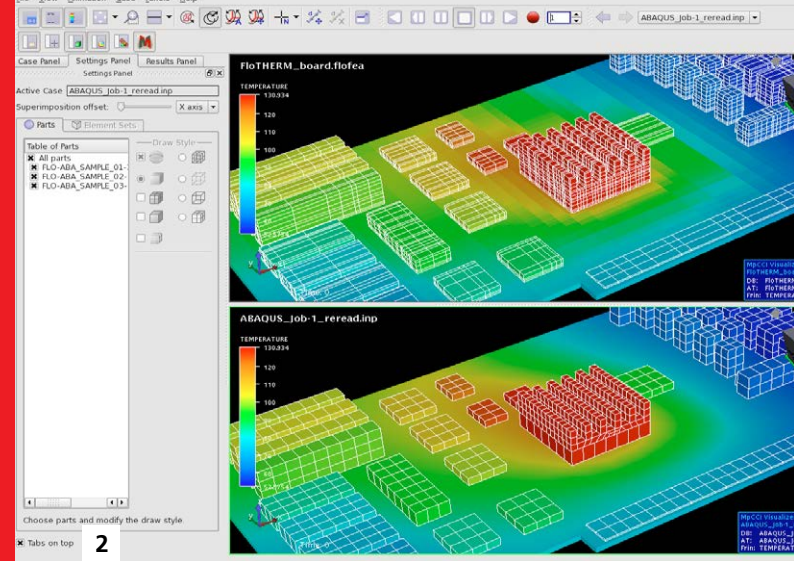
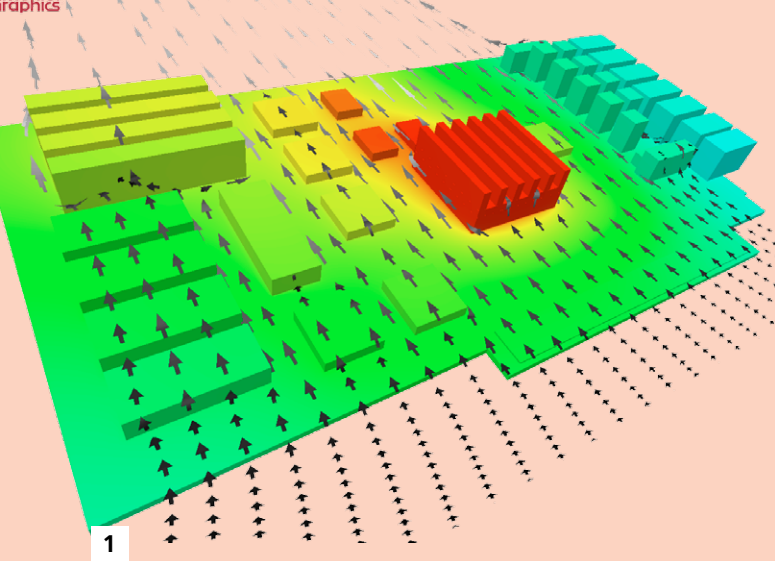
Basic features

- File-based mapping solution
- Robust and efficient algorithms
- Handling non-matching geometries
- Automated model positioning
- Volume based temperature fields
- Interactive visualisation
- Batch capability

File formats – CFD

- FloTHERM (version 10)
- FloEFD (version 13)
- EnSight Gold Case





File formats – FEA

- Abaqus (any version)
- ANSYS (12.0, 12.1, 13.0, 14.0, 14.5, 15.0)
- MSC.Nastran (any version)
- EnSight Gold Case

Temperature Export from FloTHERM 10

Solid cell temperatures within a selected assembly can be exported to a new '.flofea' file format. This file can then be loaded into the FSI Mapper. FLOFEA export from FloTHERM does not require an additional license.

Comprehensive user interface

Only a few mouse clicks are necessary to transfer thermal results from FloTHERM 10 to an FEA thermal stress calculation in Abaqus, ANSYS, or MSC.Nastran:

- Import FloTHERM result file
- Import target FEA model
- Select parts and quantities to be mapped
- Initiate mapping
- Mapped data is automatically exported into FEA solver format

The FSI Mapper provides a broad range of visual inspection capabilities. The CFD source data as well as the target FEA model can be viewed both in synchronised and overlay mode. Cutting planes, adaption of value ranges, and many other features are available.

Start thermal stress calculation

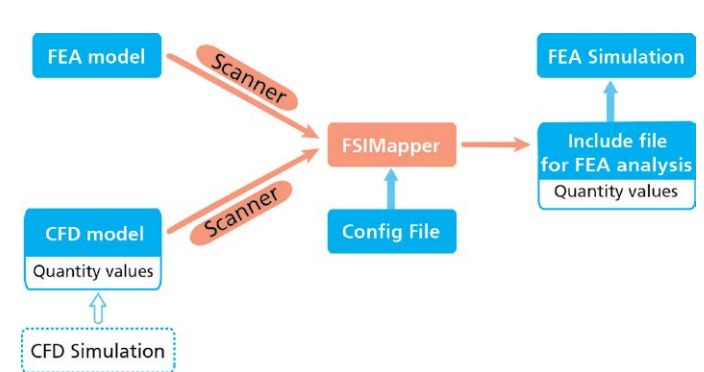
The mapped thermal fields from FloTHERM can be imported like any other externally defined loads. The exported files are fully compatible with the model file formats in ANSYS, Abaqus, and MSC.Nastran.

Easy Installation and integration

The FSI Mapper is available for Windows 32/64bit as well as Linux 64bit. The toolset consist of only a few Perl scripts and executables.

The mapping process can easily be embedded into your own CAE workflows.

If target models are in ANSYS a short conversion step using the ANSYS solver will be invoked by the FSI Mapper.



- 1 Cooling Flows on a Processor Board.
- 2 Mapping FloTHERM results to an Abaqus Model.