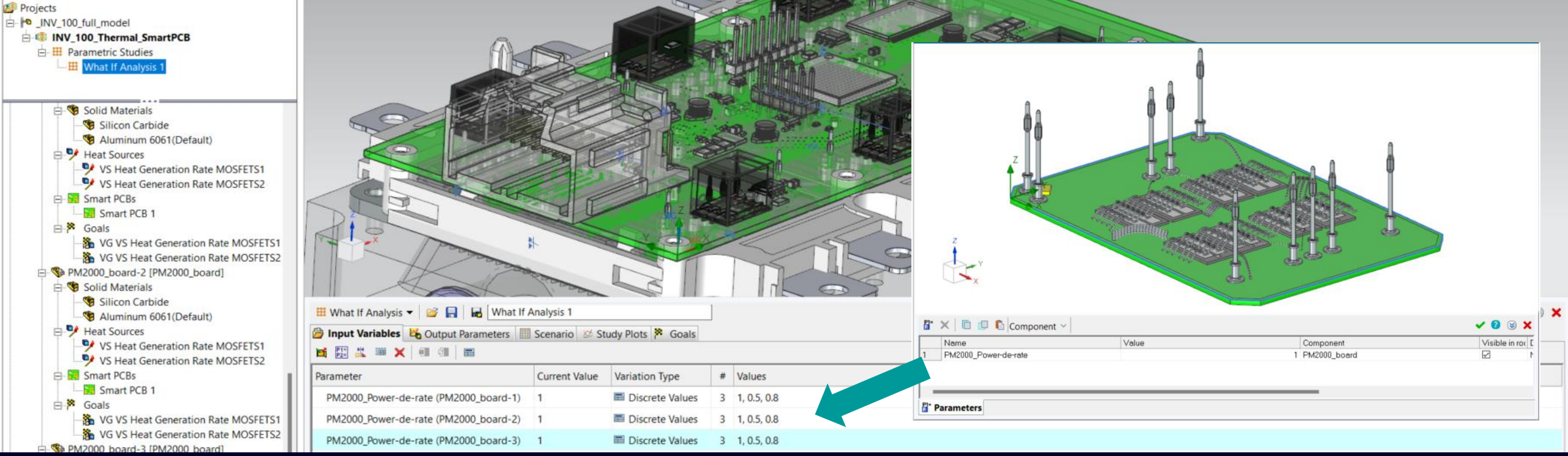

Simcenter FLOEFD

What's new in 2506

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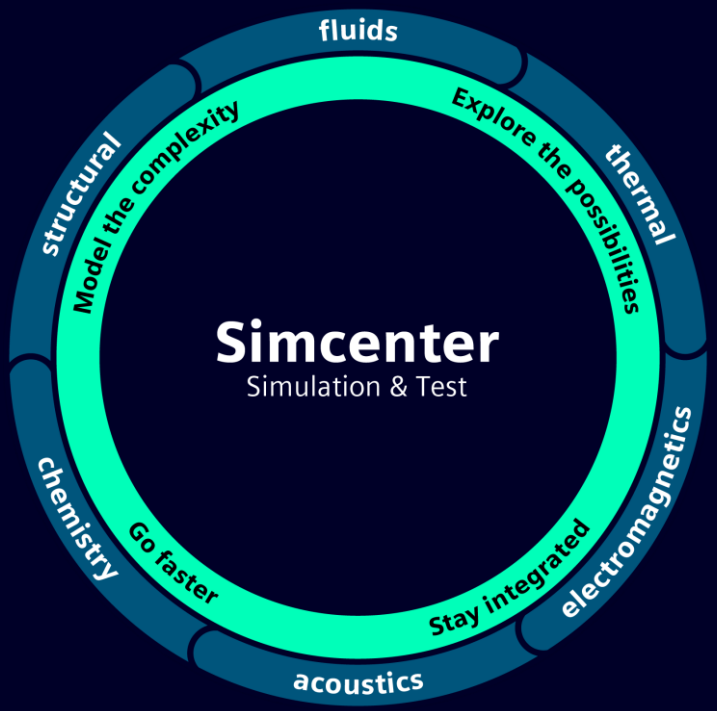
Model the complexity
Delivering insights

Explore the possibilities
Empowering decision confidence

Go faster
Increasing throughput

Stay integrated
Ensuring alignment



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Agenda

Model the complexity

- Project parameters from components
- BCI-ROM: Smart PCB
- FMU as a feature
- BCI-ROM: average and maximum temperature
- Component Explorer: component status
- Component Explorer: temperature column
- Structural: transient analysis and transient explorer

Explore the possibilities

- EFDAPI: face selection using normal
- EFDAPI: access to geometry parameters

Go faster

- EDA Bridge: Smart PCB import speed up
- EDA Bridge: Place Library Component

Stay integrated

- XTXML export (component focused)
- Catia: Simcenter Flotherm XT – to – Simcenter FLOEFD
- Catia: EDA Bridge: component replacement
- Catia: EDA Bridge: import components as parts or bodies

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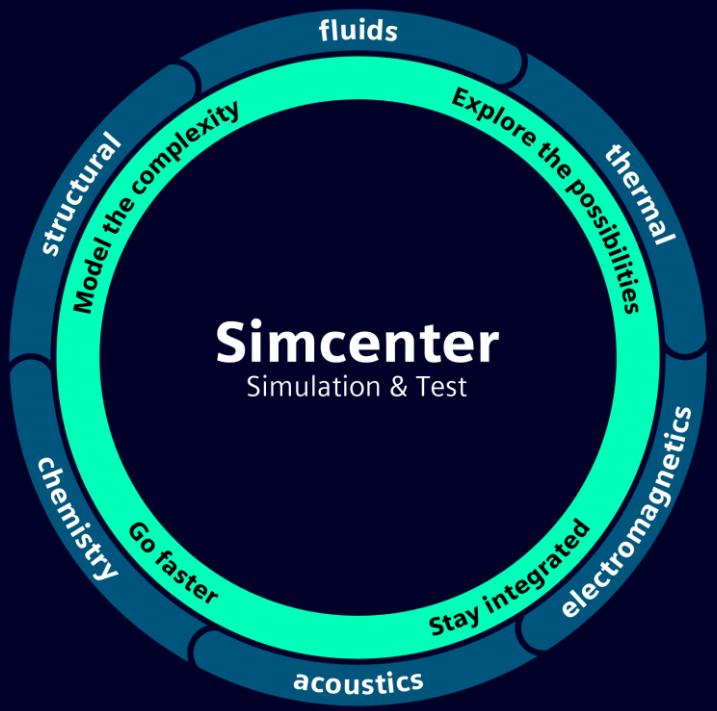

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Project parameters from components

Model the complexity

Challenge

How to control multiple sub-models embedded into the current analysis project individually

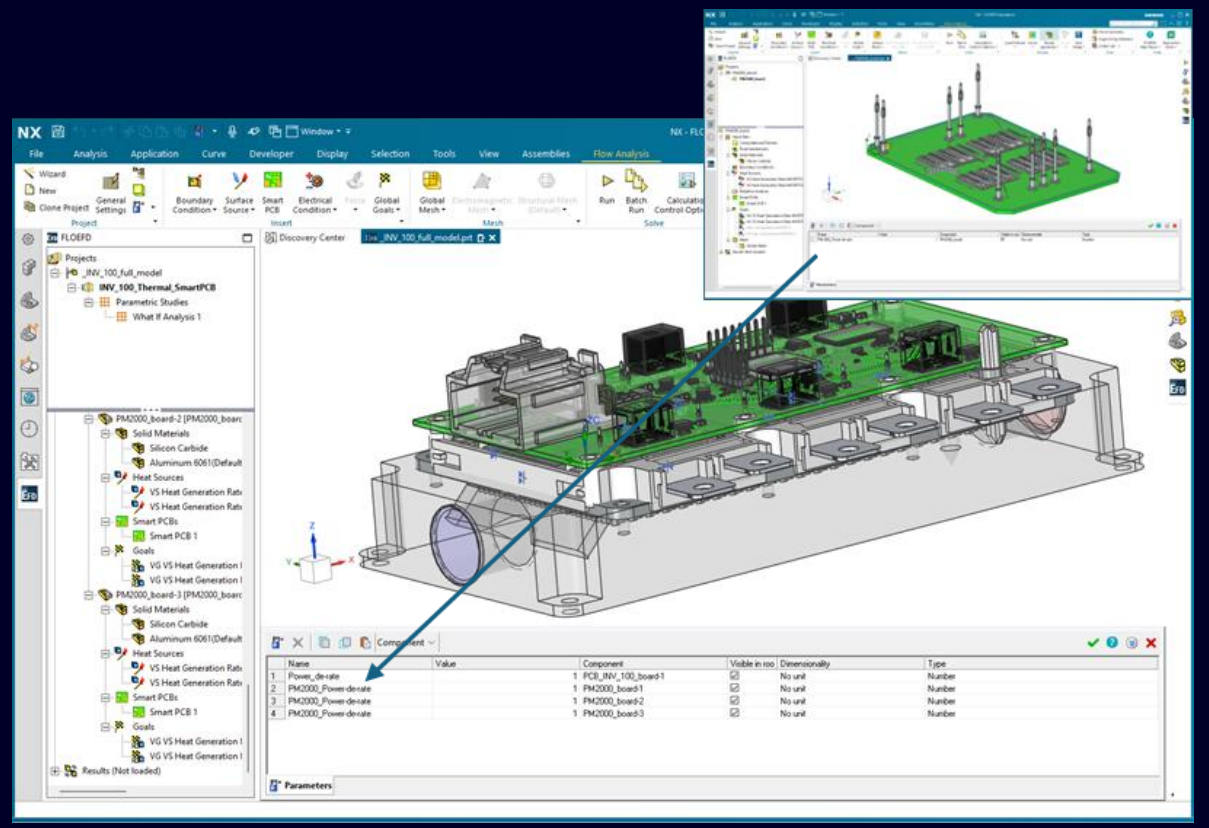
Solution

Define project parameters in the sub-models and they propagate upward

Benefits

- Control sophisticated dependencies defined in embedded components
- Enabling the creation of elaborate library components and re-use of sub-models
- Adjust parameters of individual components within a group of identical sub-models

Manage sub-models efficiently



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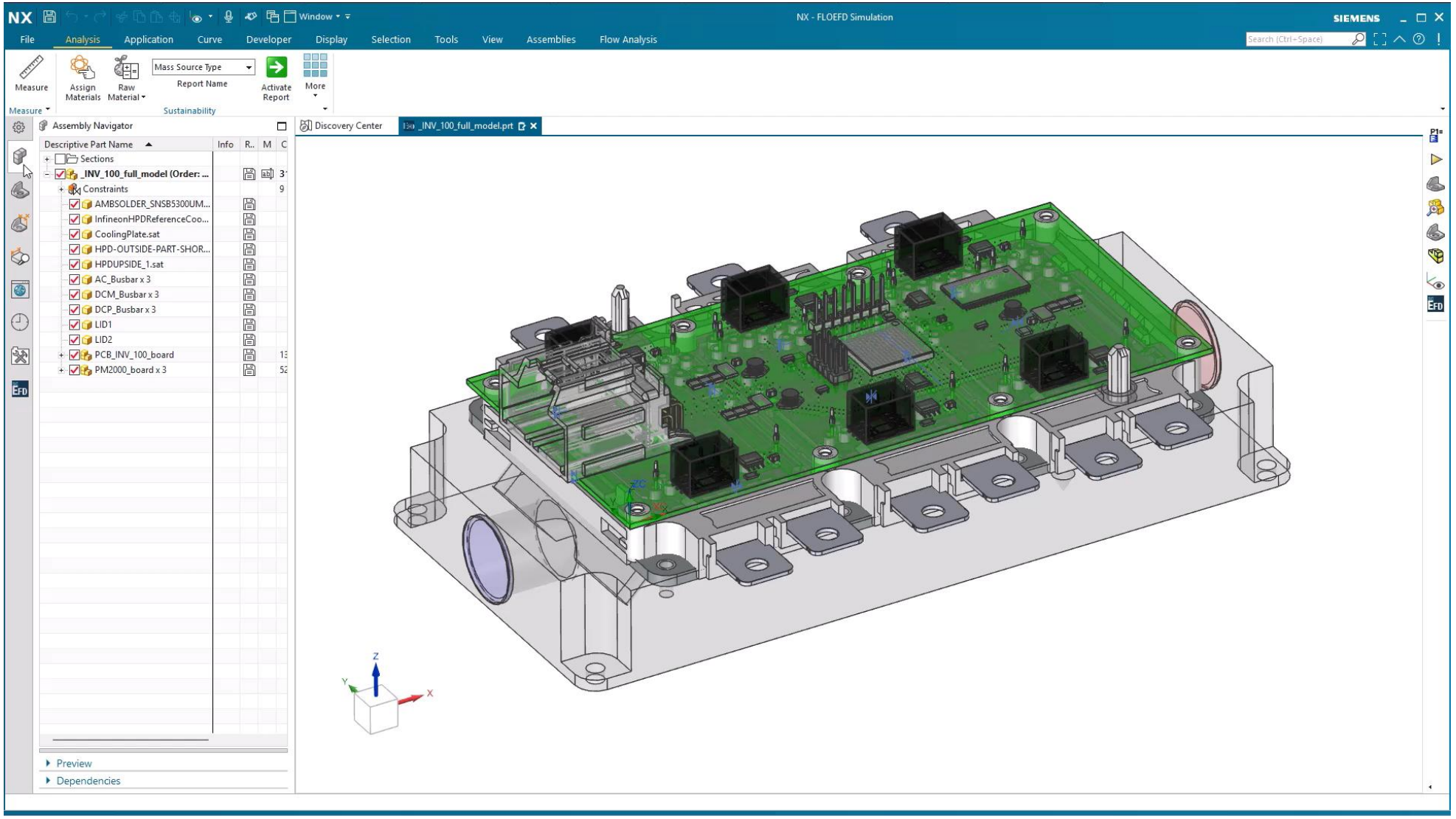
Project parameters from components



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BCI-ROM: Smart PCB

Model the complexity

Challenge

BCI-ROM models using layered PCB may not provide enough accuracy, explicit is too complex

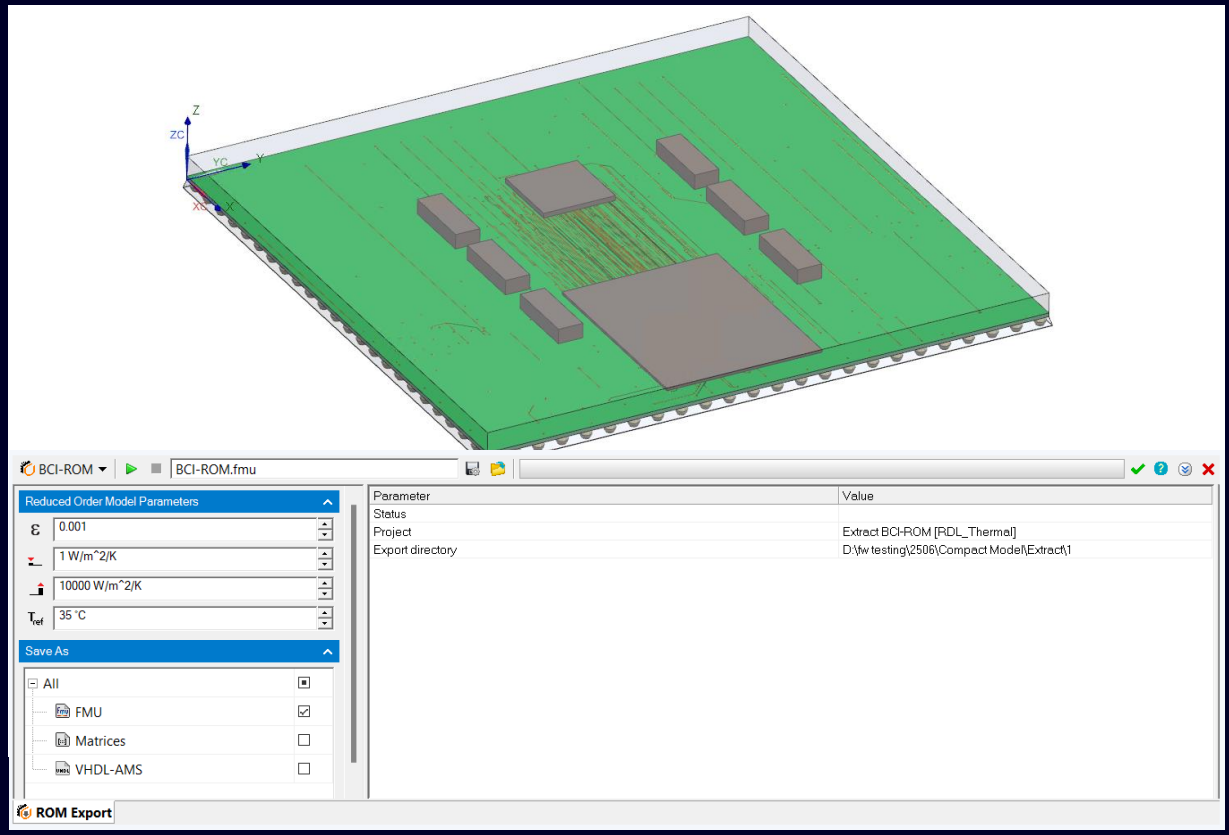
Solution

BCI-ROM export supports models with Smart PCB

Benefits

- Extract BCI-ROM using high fidelity representation of PCB faster
- Use Averaging mode and control tile size to simplify the model

Extract BCI-ROM from model with appropriate PCB fidelity efficiently



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BCI-ROM: Smart PCB

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FMU as a feature

Model the complexity

Challenge

Inserting several FMUs into FLOEFD is challenging, FMU cannot be in subprojects

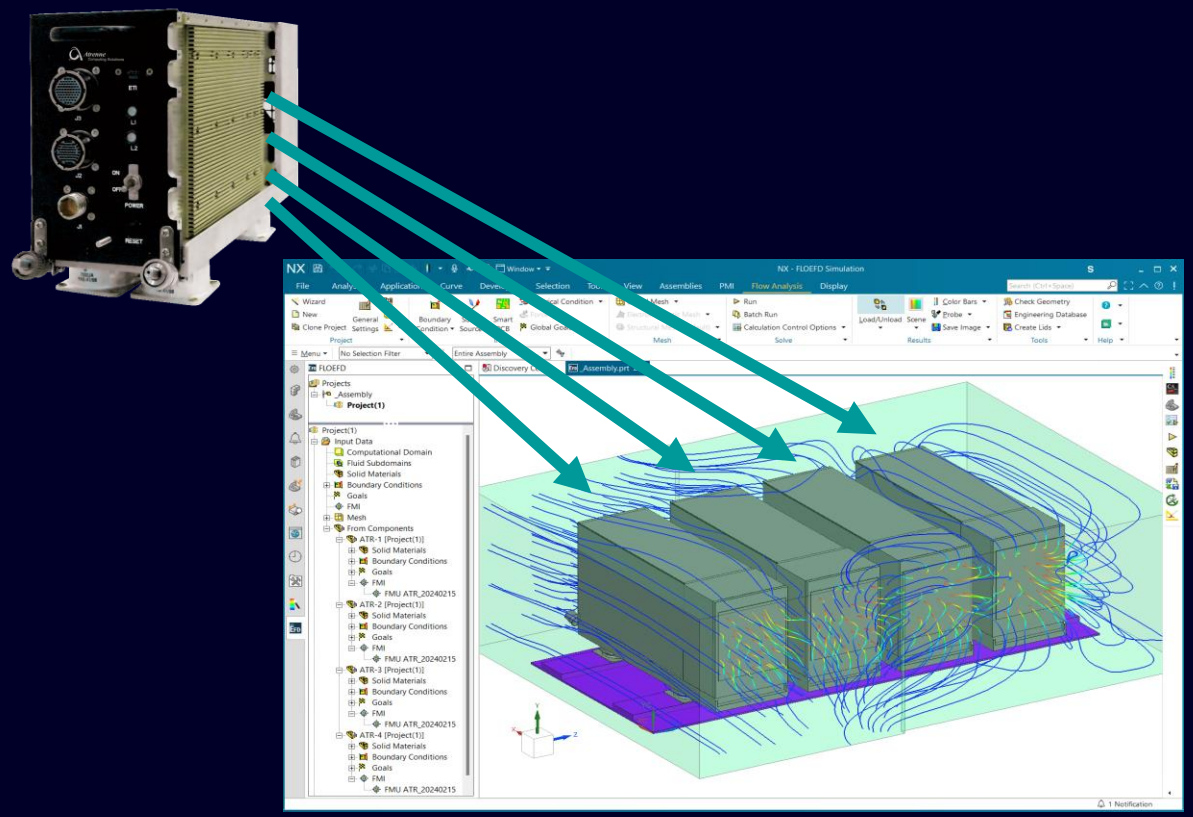
Solution

Straight forward set up and management of multiple FMUs in a project, and re-use via libraries

Benefits

- Manage large amounts of FMUs in one Simcenter FLOEFD project easily
- Store FMU in a subproject, leverage it using “Add from Component” feature
- Create library compact model with FMU

Manage FMUs more easily



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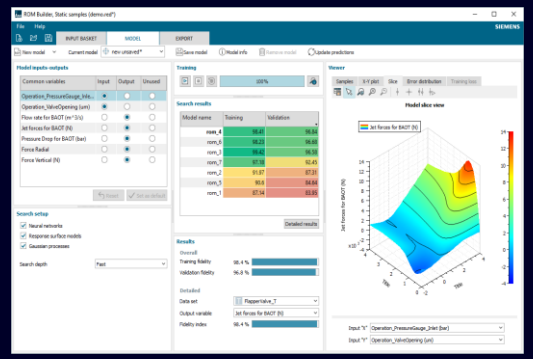
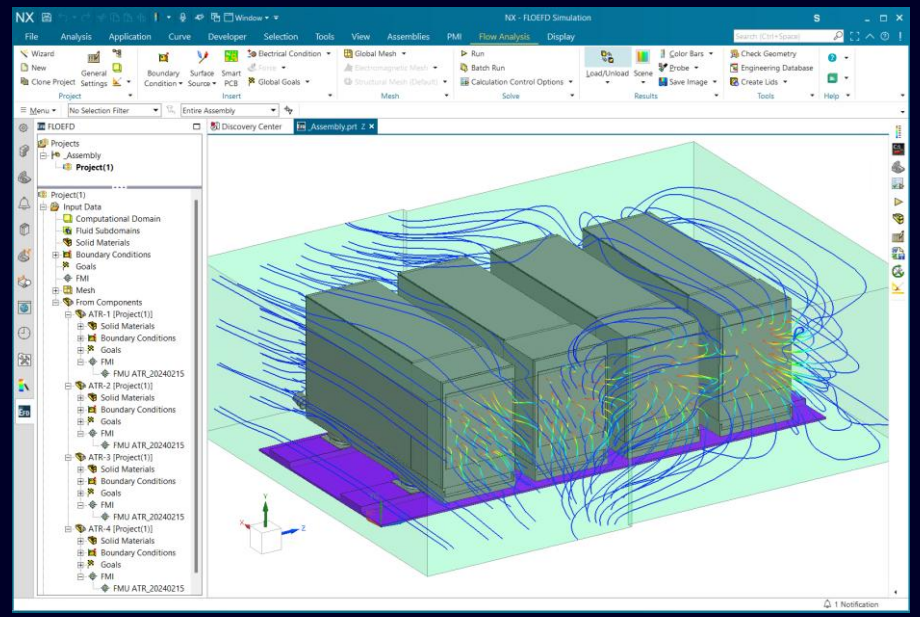
FMU as a feature
Example

Original model is parameterized in Simcenter FLOEFD and calculated via DOE. Results of parametric study are used as input data for Simcenter ROM. Resulting ROM is exported to FMU and then inserted into compact model. Compact model containing FMU is inserted into higher level project and instanced several times.

Input and output parameters of the FMU:

- Pressure + Temperature
- HTC
- Wall Temperature (bottom)
- Mass Flow Rate
- Temperature of Components
- Air outlet Temperature





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BCI-ROM: average and maximum temperature

Model the complexity

Challenge

Predict average and maximum component temperature with BCI-ROM

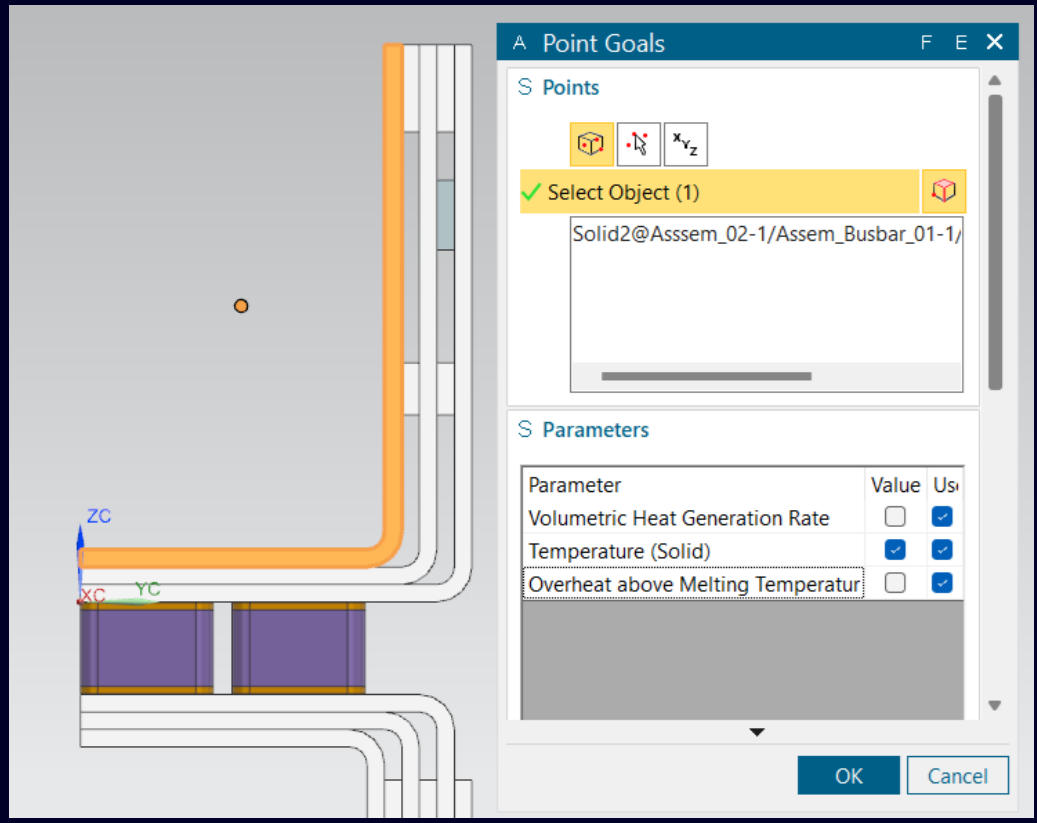
Solution

Updated goals reporting in BCI-ROMs

Benefits

- Average temperature can be correlated to energy
- You do not need to guess location of maximum temperature, it is automatically calculated
- Goals for arbitrary bodies can be created automatically

Predict average and maximum goals with BCI-ROM



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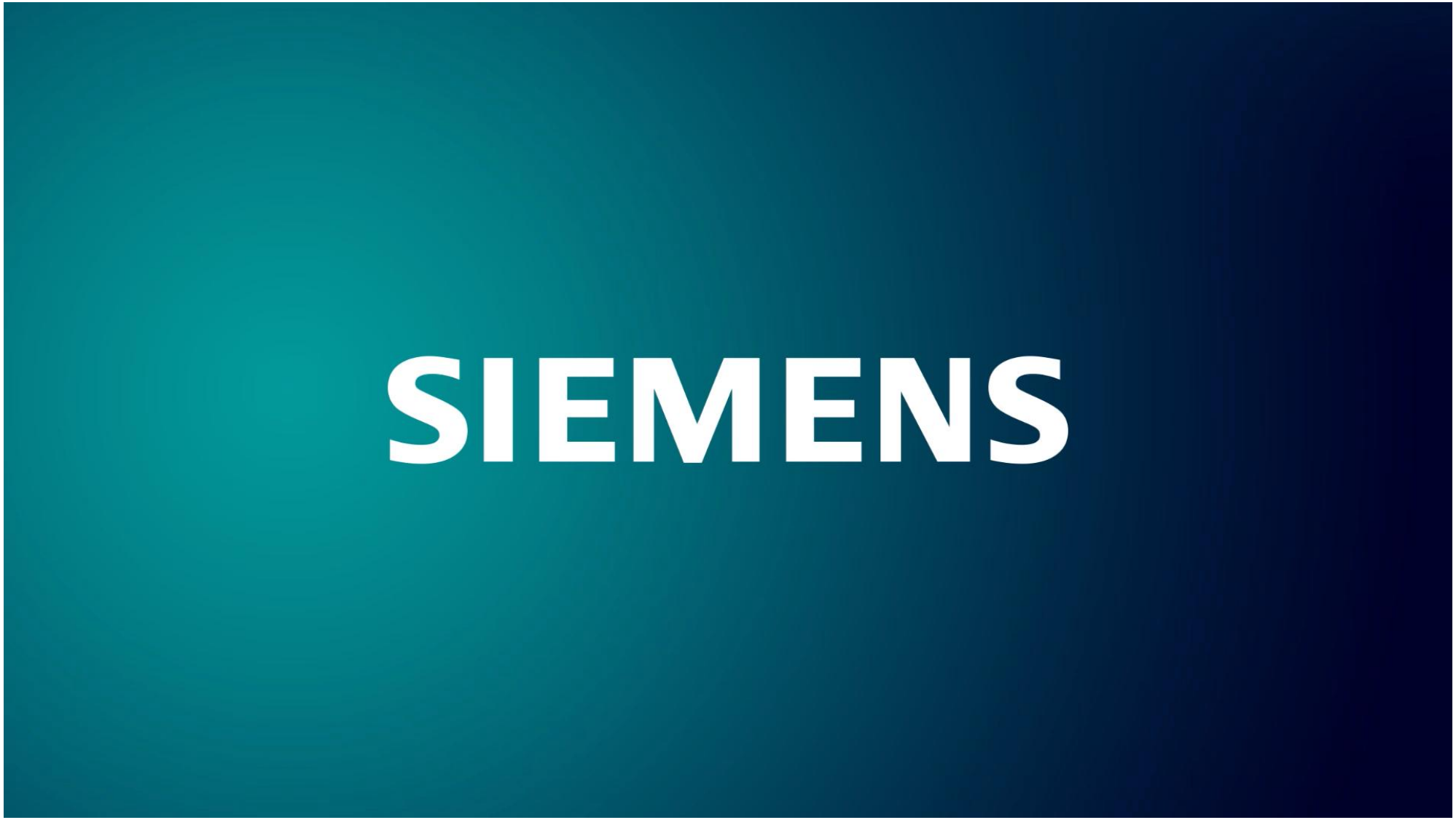
BCI-ROM: average and maximum temperature



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Component Explorer: component status

Model the complexity

Challenge

Manage component status and features in the same dialog

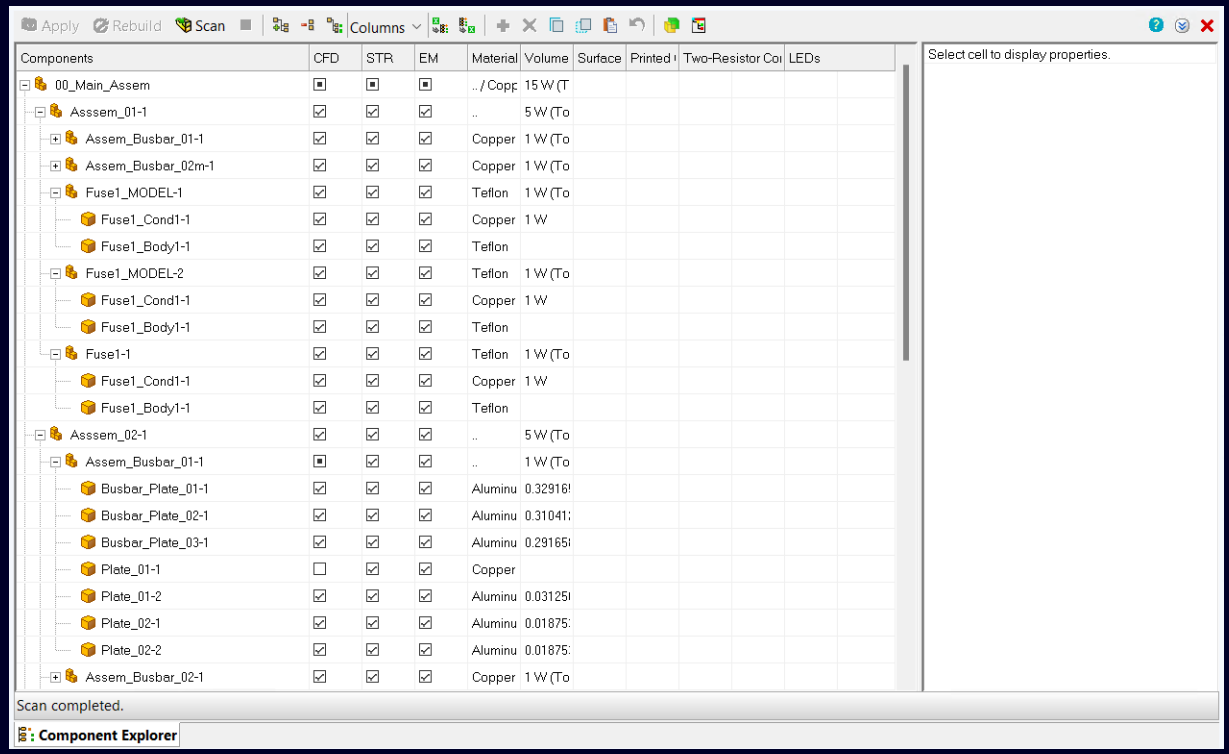
Solution

A status column in the Component Explorer tool

Benefits

- Component status and features are in the same dialog
- You can also remove volume features applied to component from Component Explorer

Control component status and associated features more easily



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Component Explorer: component status

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Component Explorer: temperature column

Model the complexity

Challenge

Retrieving temperatures of all components using Volume Goals can be time consuming

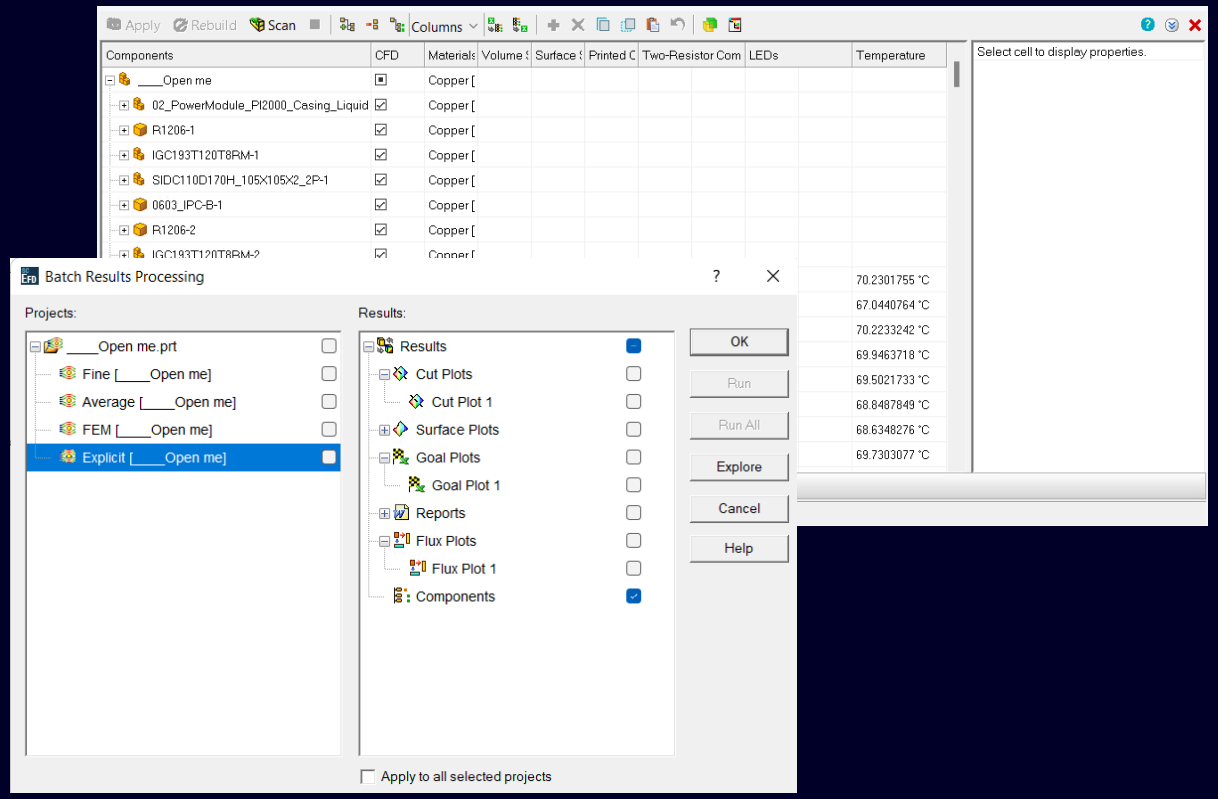
Solution

A temperature column in Component Explorer and export of final values to Excel

Benefits

- Provides temperatures of all solids with minimal effort and does not slow down the solver
- Exports matching table of component names, input data and resulting temperatures automatically through Batch Results Processing

Conveniently obtain temperatures of components



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Component Explorer: temperature column

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Structural: transient analysis and transient explorer

Model the complexity

Challenge

Run a coupled Fluid, Thermal and Structural unsteady analysis; process the results

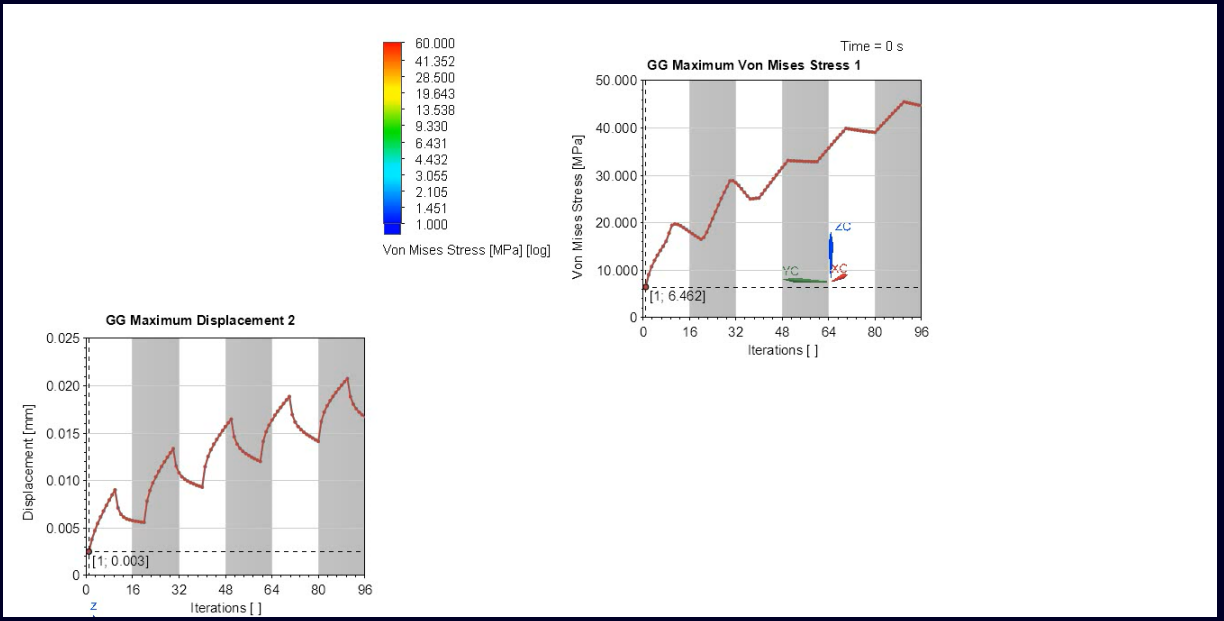
Solution

Fit-for-purpose co-simulation of Fluid and Thermal with Nastran non-linear 401 solver

Benefits

- All analysis types in one Simcenter FLOEFD project
- Nastran DAT file with time-dependent temperature and pressure loads can be exported
- Intermediate results of a non-linear structural analysis can be processed in Transient Explorer

Run unsteady structural analysis



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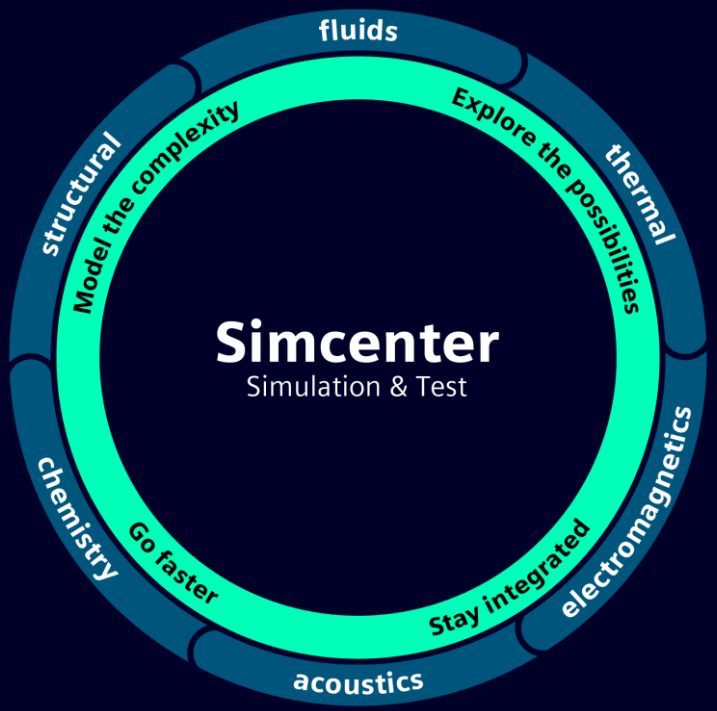

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Simcenter FLOEFD API (EFDAPI): : Face selection using normal

Explore the possibilities

Challenge

Selecting faces to apply a feature requires prior preparation of the model (by color option…)

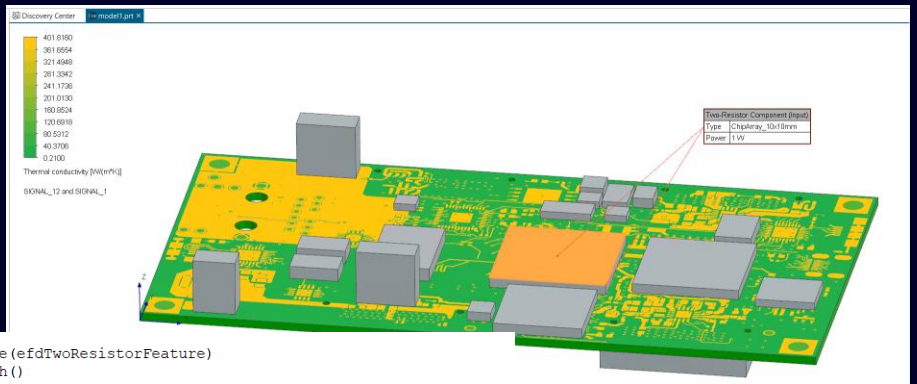
Solution

Simcenter FLOEFD API function to select face by normal vector

Benefits

- There is no need to color faces to prepare a model for use with API
- Normal vector is specified in local coordinate system, so it is easy to assume coordinate values

Select Top face for 2R and LED models with API



```
Set TR = Features.CreateFeature(efdTwoResistorFeature)
Set Path = Model_Doc.CreatePath()
Set Elem = Path.CreateElement()
Elem.SetType (efdSelCOMPONENTS)
Elem.SetName (Component)
Path.AddElement (Elem)
Set Elem = Path.CreateElement()
Elem.SetType (efdSelFACES)

Dim N(2) As Double
N(0) = 0
N(1) = 0
N(2) = 1
Elem.SetNormal (N)

Path.AddElement (Elem)
entities = Model_Doc.GetEntities(Path)
Project.CreateAttribute entities(0), uuids(0), names(0)
TR.PutFacesUUIDsAndNames uuids, names
TR_GUID = EDB.GetEDBItems(efdEDBComponent).GetItemByName("ChipArray_10x10mm").GetGUID()
TR.SetEDBTwoResistorUUID TR_GUID
TR.put_FeatureNamePattern Component
TR.GetParameter(efdHeatGenerationRate).SetValue (1)

Features.AddUpdateFeature Project, TR
```

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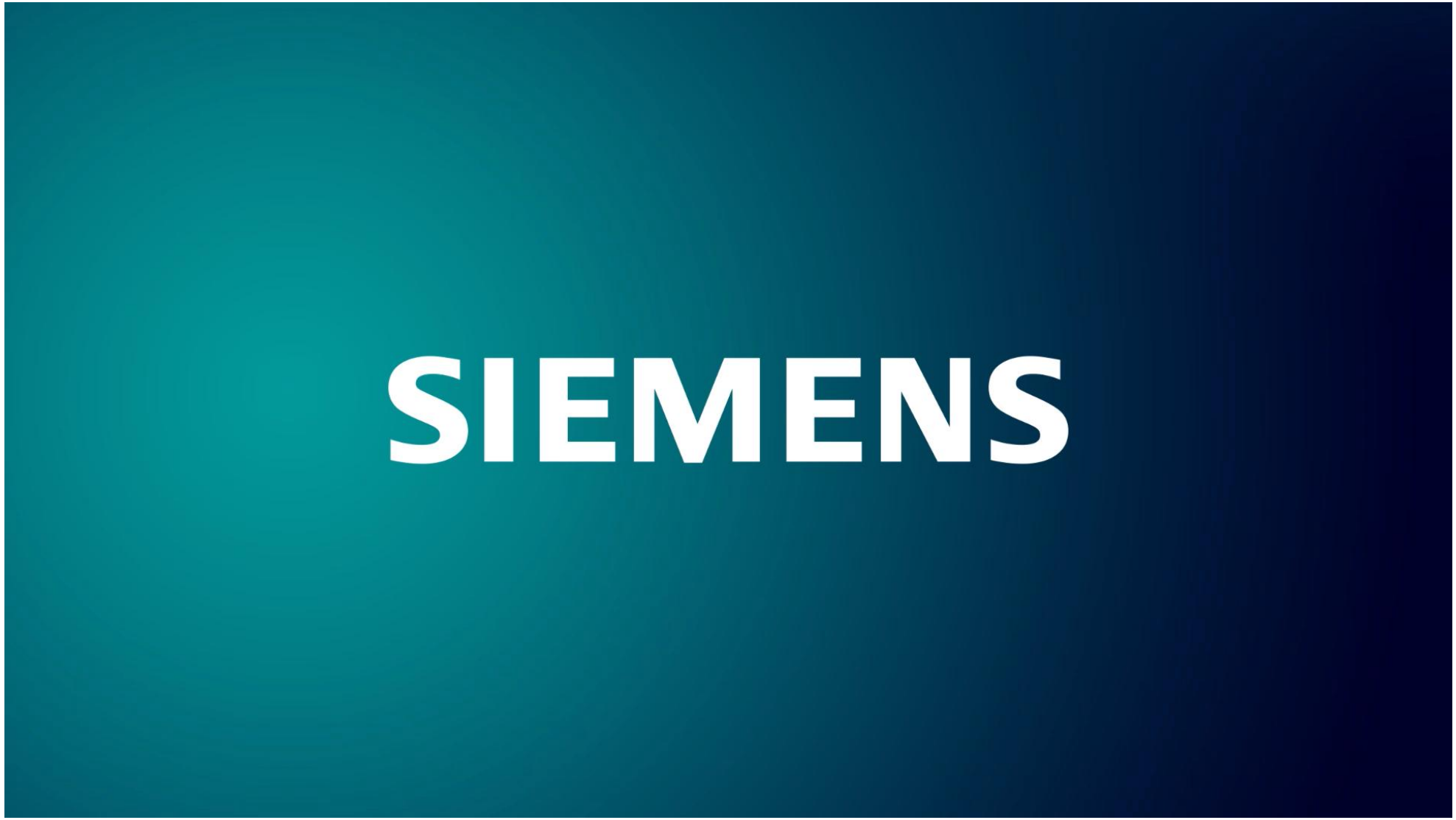
Simcenter FLOEFD API (EFDAPI): Face selection using normal



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Simcenter FLOEFD API (EFDAPI): Access geometry parameters

Explore the possibilities

Challenge

Geometry parameters need to be controled along with simulation parameters through external script

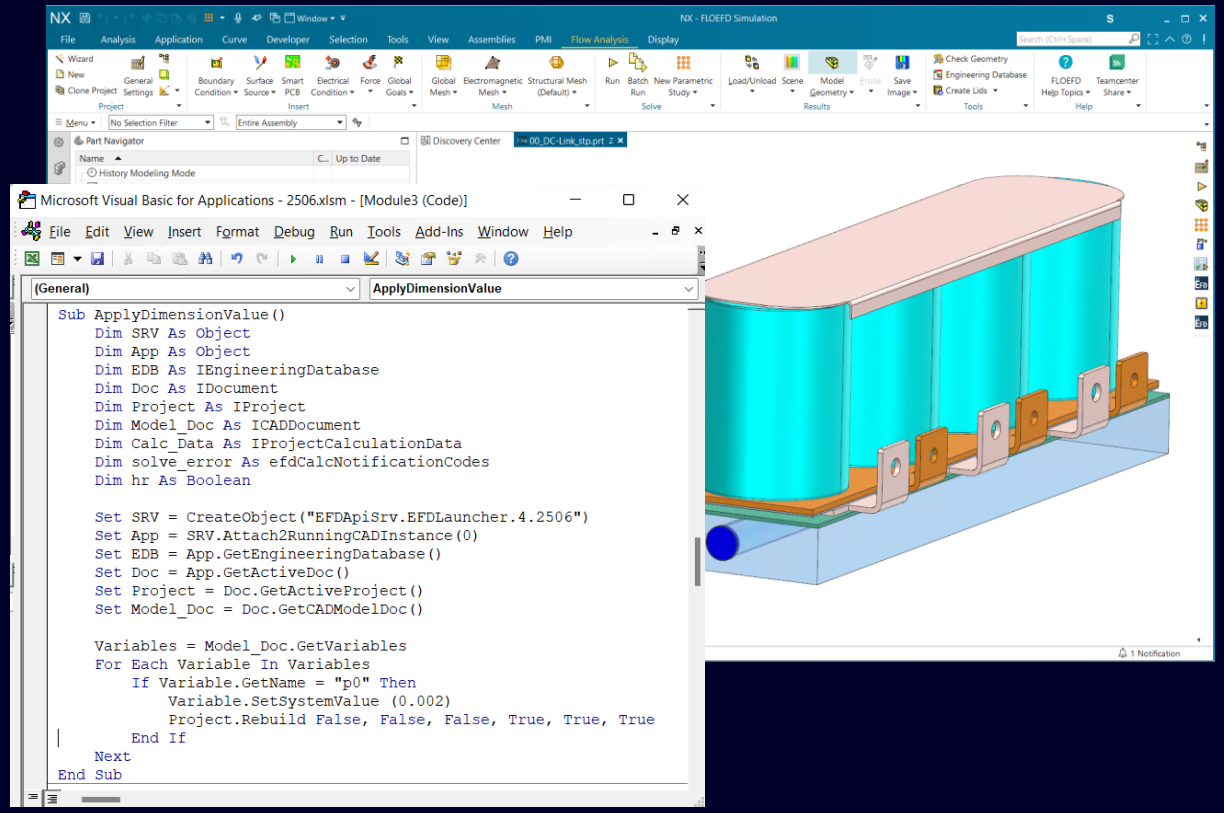
Solution

Simcenter FLOEFD API function to access geometry parameters and change their values

Benefits

- You do not need to create additional scripts to change model geometry
- Optimize your calculation model with external optimizers more easily

Alter FLOEFD and geometry features from one script



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Simcenter FLOEFD API (EFDAPI): Access geometry parameters

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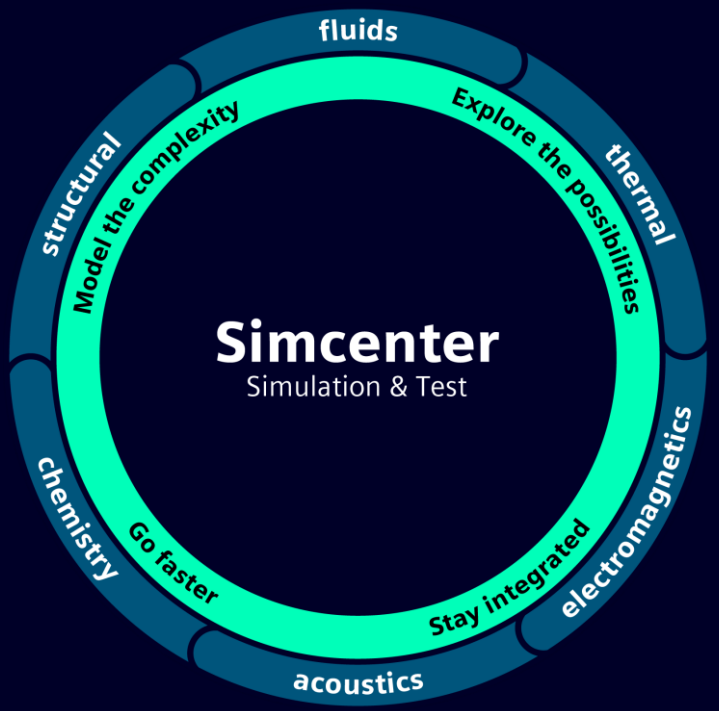

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Smart PCB import speed up

Go faster

Challenge

Importing complex Smart PCBs into Simcenter FLOEFD can be time consuming

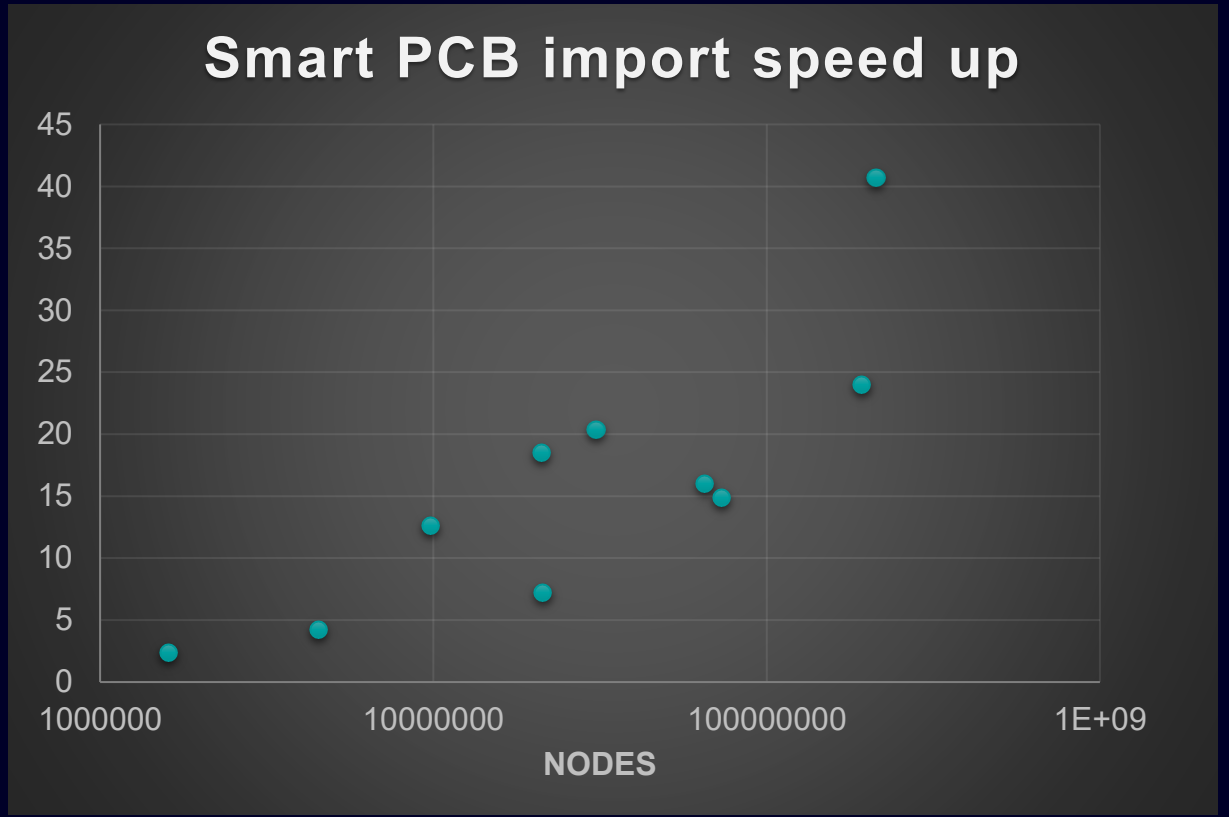
Solution

Smart PCB import speed significantly enhanced

Benefits

- Huge Smart PCBs can be imported faster: time needed to import examples of huge Smart PCBs is reduced from **5 hours** to **7 minutes**, speed up coefficient is up to 40
- Import of mid-sized PCB is accelerated **2 – 20 times**

Import Smart PCB faster



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EDA Bridge: Place Library Component

Go faster

Challenge

Delays in EDA data updates stall efficient PCB design changes

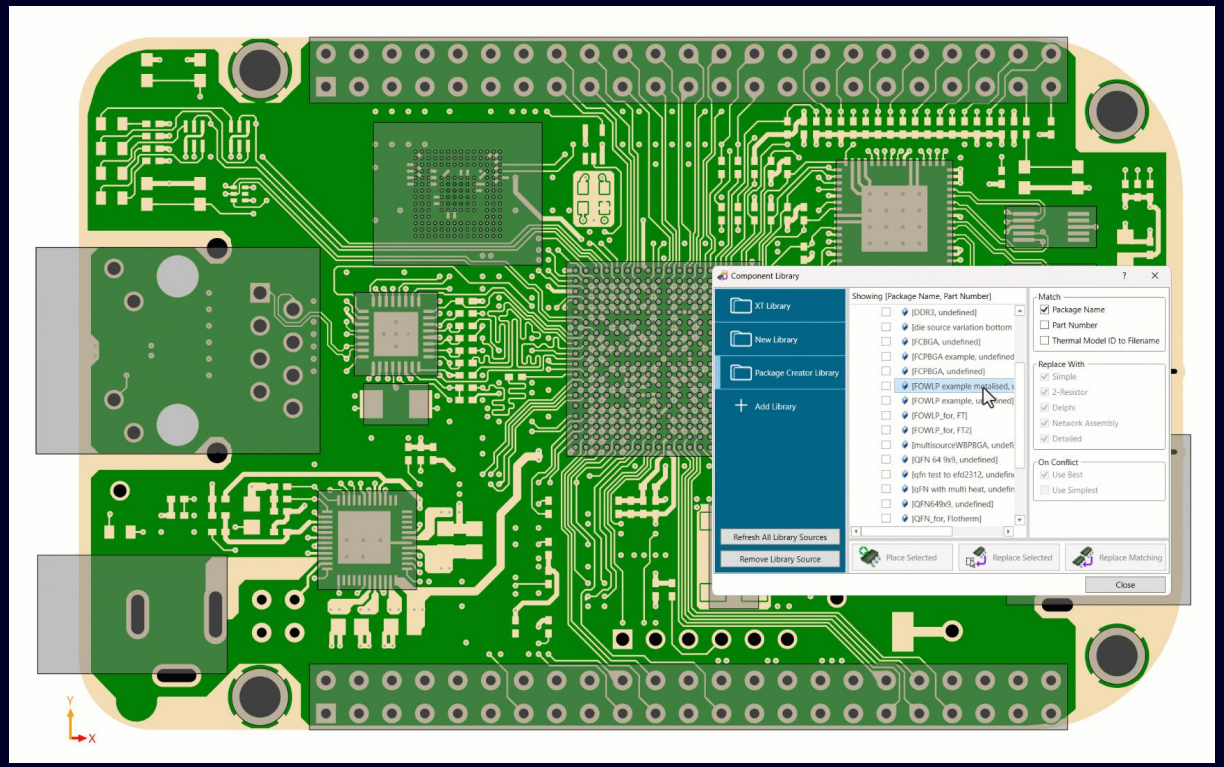
Solution

Direct library access accelerates PCB design changes, bypassing EDA data dependencies

Benefits

- Enhances efficiency by removing intermediary steps with direct library component placement
- Boosts productivity with scripting support for automated and precise component placement
- Facilitates swift PCB design changes without relying on updated EDA data

Accelerate PCB design modifications



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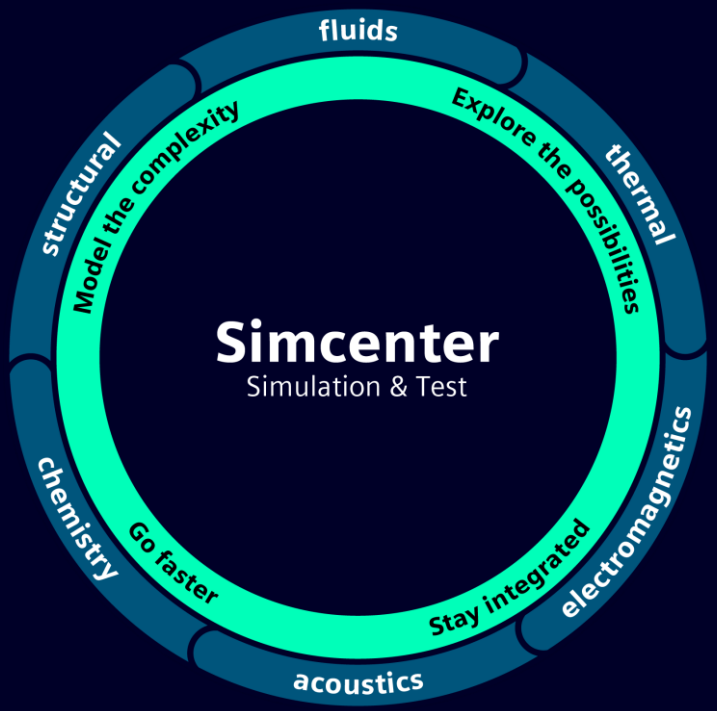

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XTXML export (component focused)

Stay integrated

Challenge

XTXML library cannot be edited with Simcenter FLOEFD

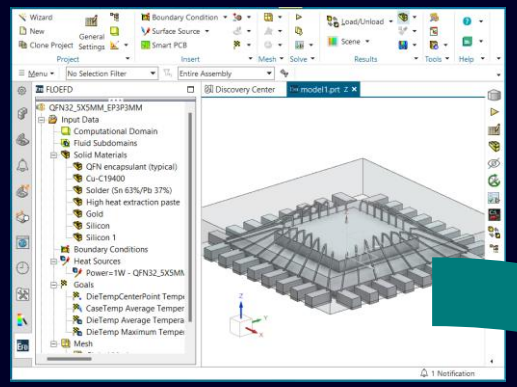
Solution

Export to XTXML capability introduced

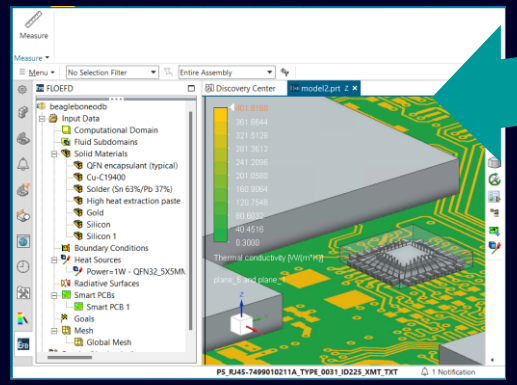
Benefits

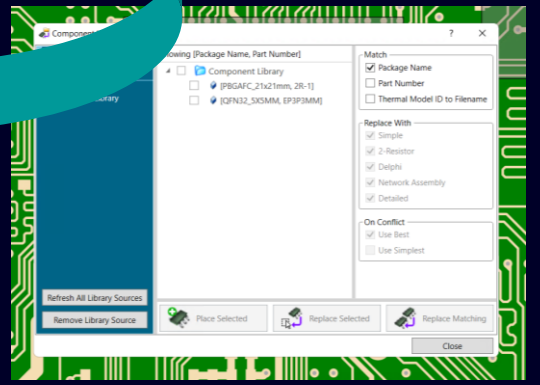
- Ability to edit XTXML files exported from Package Creator or create new XTXML library items with Simcenter FLOEFD
- Ability to convert PDML into XTXML through FLOEFD project and then use it for component replacement

Create XTXML library with FLOEFD



XTXMLA





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XTXML export (component focused)

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CATIA: EDA Bridge: Library System, Component Replacement

Stay integrated

Challenge

Time consuming to replace and position IC Package models after transfer from EDA Bridge.

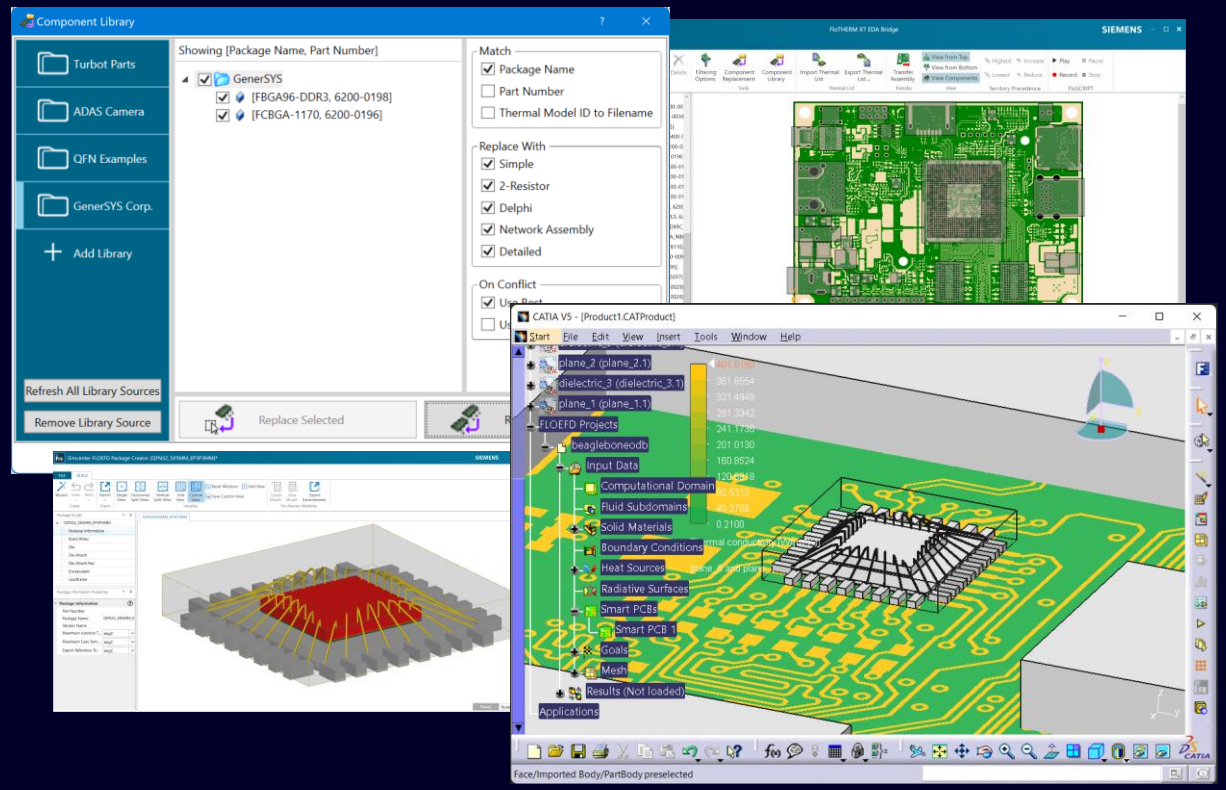
Solution

Replace with component representations from a library source within EDA Bridge.

Benefits

- Replace automatically (Replace Matching)
- Match by Package Name, Part Number or Thermal Model ID
- Specify model level type to use
- Replace manually (Replace Selected)
- Scripting support

Save time by replacing packages directly into the correct location from the library



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CATIA: EDA Bridge - Library System, Component Replacement

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CATIA: EDA Bridge: Option to import components as parts or bodies from EDA Bridge

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Challenge

Customer wants to import components as parts (optionally).

Solution

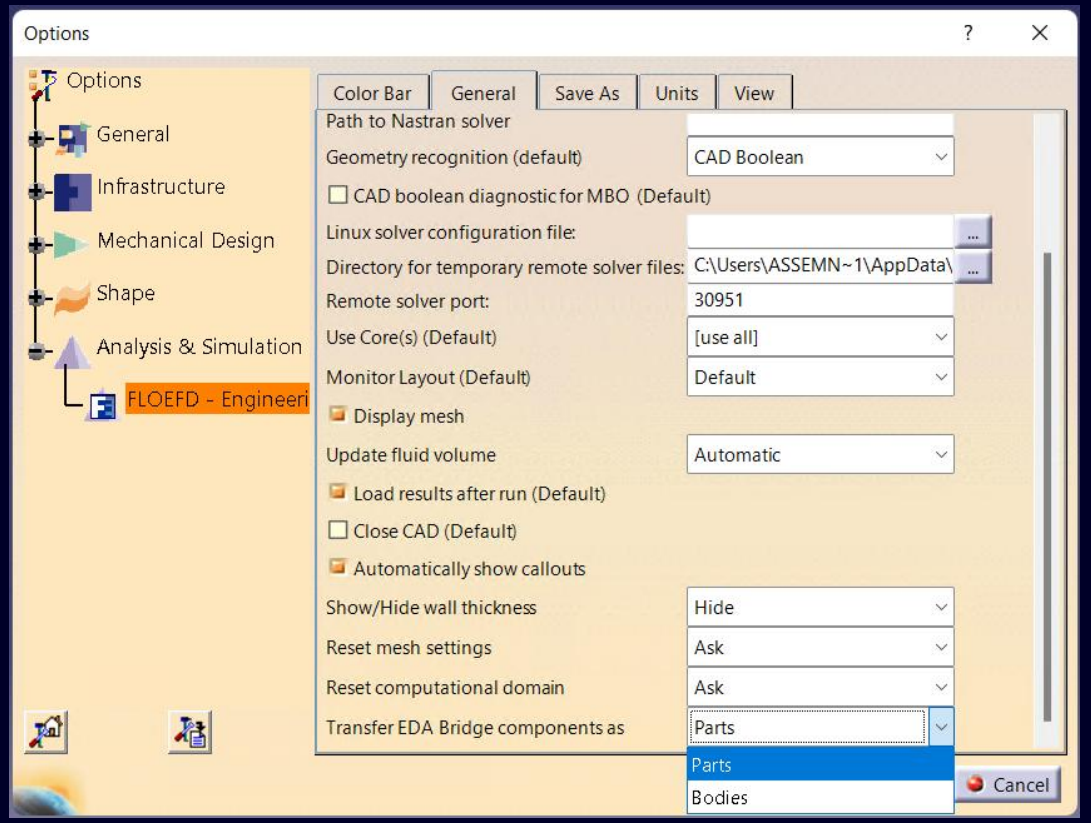
Option to choose how to transfer PCB components in Tools/Option dialog.

Benefits

You can choose the method of importing components:

- Bodies are imported faster and stored in one multibody part
- Parts can be managed more easily

Added flexibility for CAD definition of imported PCB



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CATIA: Simcenter Flotherm XT to Simcenter FLOEFD Model Import

Stay integrated

Challenge

Transfer models from Simcenter Flotherm XT to Simcenter FLOEFD for CATIA

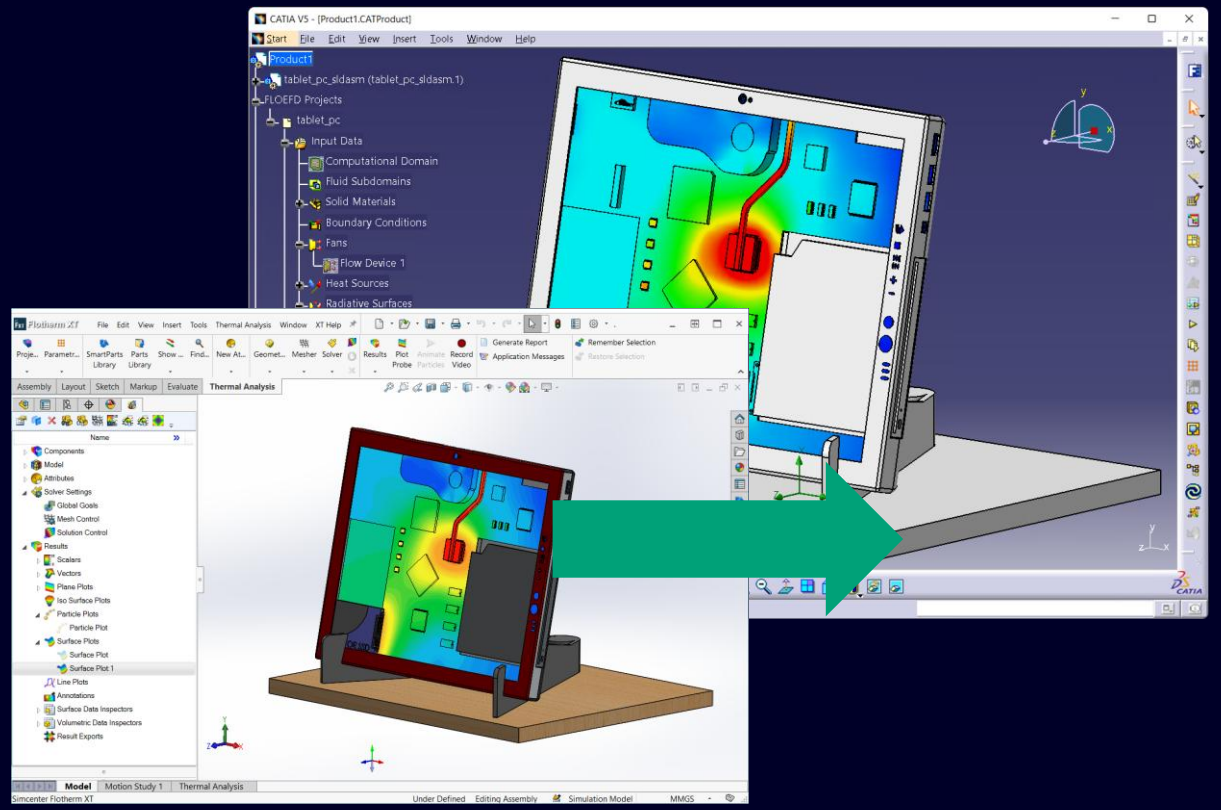
Solution

Simcenter FLOEFD for CATIA can now import a Flotherm XT model/project through XTXML format

Benefits

- You can access extended capabilities of Simcenter FLOEFD while leveraging original model setup from Simcenter Flotherm XT

Transfer Simcenter Flotherm XT projects to Simcenter FLOEFD for CATIA



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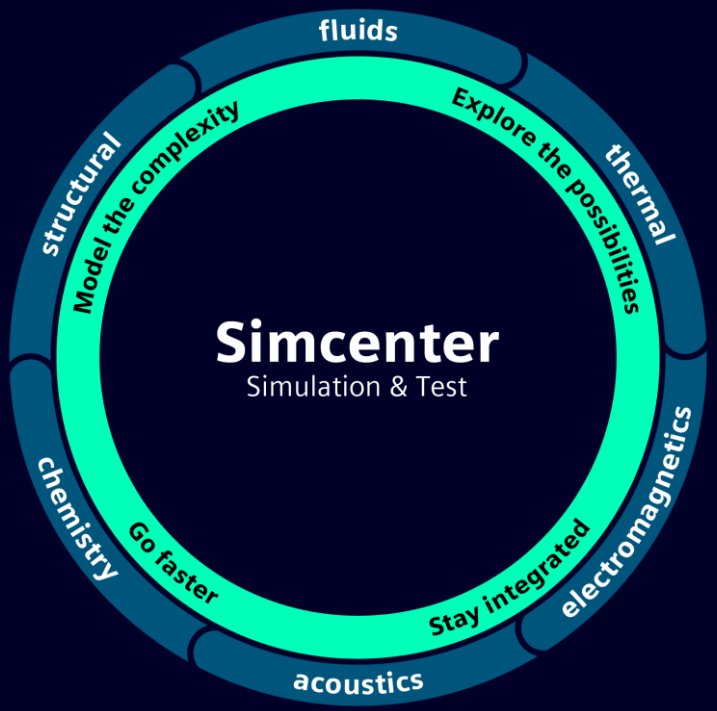

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