Web Workshop COMSOL

ICPS 2017

Politecnico di Torino

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Today's Agenda

Introduction to COMSOL Multiphysics® software

- Workflow of building a model
- Live software demo

COMSOL 2017

- Modeling and Simulation
  - Ready made physics interfaces
  - General mathematics interfaces
  - Built-in CAD tools
  - Add-on modules with specialized physics interfaces
  - LiveLink™ products to connect with partner software
    - Most major CAD tools
    - MATLAB®
    - Excel®
- Development tools
  - Model Builder
  - Physics Builder
  - Application Builder
- Deploying Apps
  - COMSOL Multiphysics®
  - COMSOL Server™
    - Browser and Windows® clients

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All Industries Benefit from Multiphysics Simulation

- Power technology
- Rocket propulsion
- Product safety and quality
- Electronics cooling
- Energy technologies
- Environmental engineering
- Building physics
- Software quality assurance
- Magnetic fusion energy
- Technology entrepreneurship
- Electronic packaging

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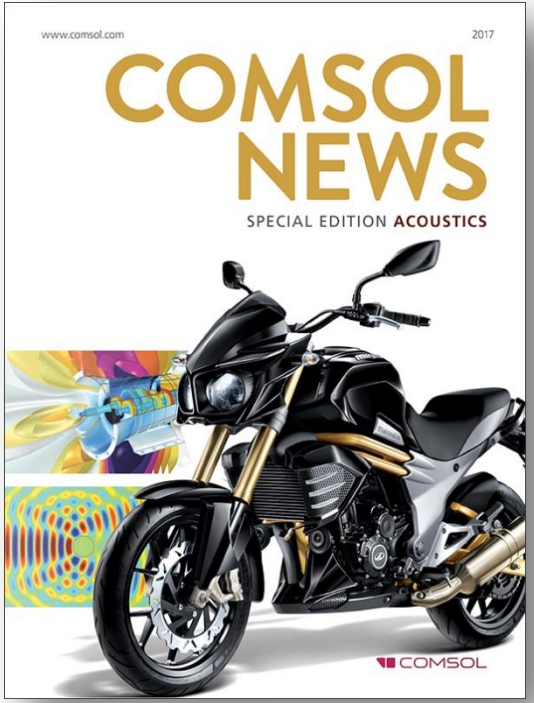
Special Edition – Acoustics



www.comsol.it/offers/comsol-news-2017-special-edition-acoustics

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Resources to Support Your Work

- Online Workshops & Seminars
- Webinars
- Free technical support
- 800+ tutorial models and apps
- Tutorial videos
- Technical blog posts
- Discussion forum and model exchange
- Intensive training courses
- COMSOL Days
- COMSOL Conference

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COMSOL CONFERENCE 2017 ROTTERDAM

SAVE THE DATE

October 18–20

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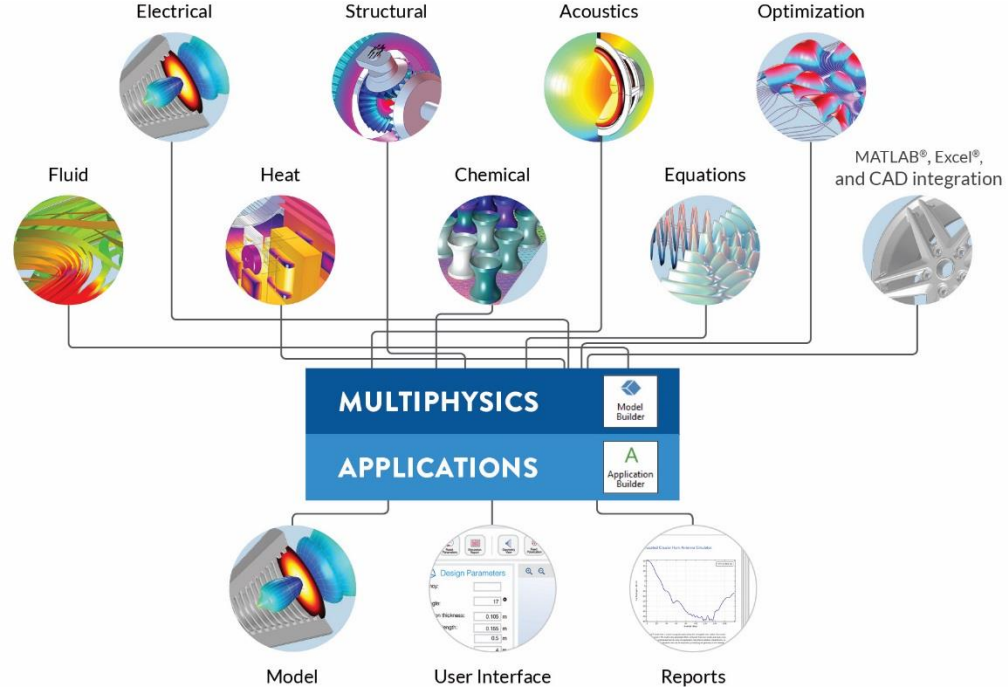
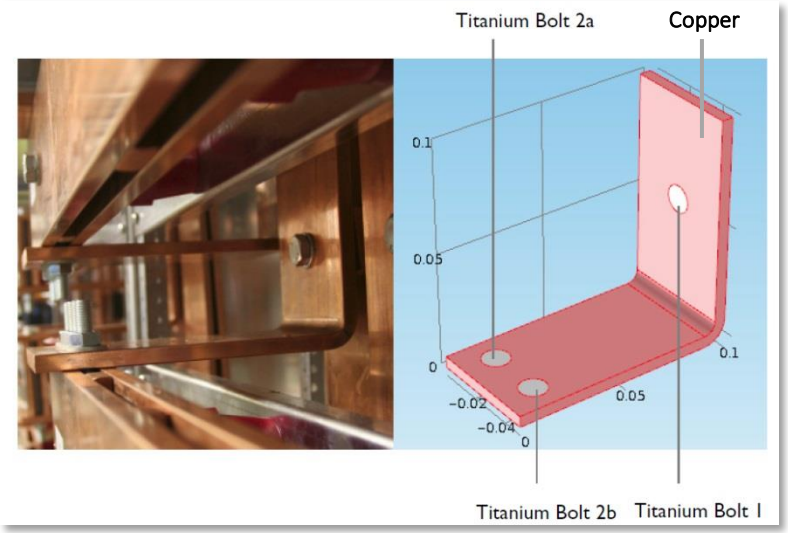
COMSOL Multiphysics®



Demo COMSOL Multiphysics®

Live Demo: Busbar

- Jule heating of a busbar
  - Operates in DC and supports high currents
  - In an unexpected situation, the current is forced through bolts
  - Thermo-mechanical simulation must account for resistive losses



Electromagnetism

$$\nabla \cdot J = q_j$$

$$J = \sigma E + J_e$$

$$E = -\nabla V$$

Heat transfer

$$\rho C_p u \cdot \nabla T = \nabla \cdot (k \nabla T) + Q$$

Joule effect

$$Q = J_x \cdot E_x + J_y \cdot E_y + J_z \cdot E_z$$

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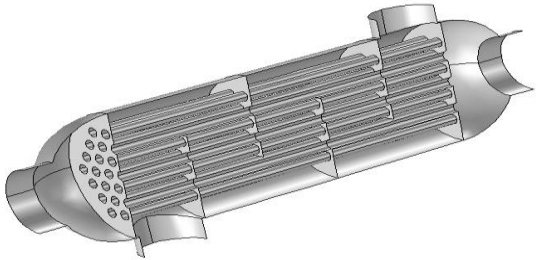
Simulation workflow

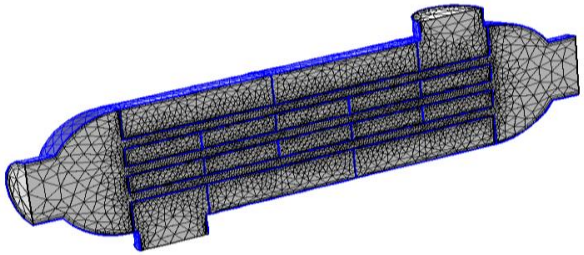
1 Geometry



2 Materials and physics

- Materials
  - Air *(mat1)*
  - Water, liquid *(mat2)*
  - Structural steel *(mat3)*
- Turbulent Flow, k-ε *(spf)*
  - Fluid Properties 1
  - Wall 1
  - Initial Values 1
  - Inlet (Water)
  - Outlet (Water)
  - Inlet (Air)
  - Outlet (Air)
  - Symmetry 1
  - Interior Wall 1
- Heat Transfer in Fluids *(ht)*
- Multiphysics
  - Non-Isothermal Flow 1 *(nitf1)*

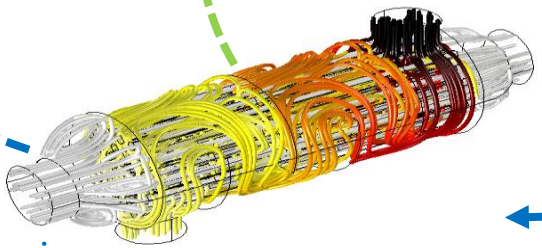
3 Mesh



4 Solution

- Study 1
  - Step 1: Stationary
  - Solver Configurations
    - Solution 1

5 Post-processing



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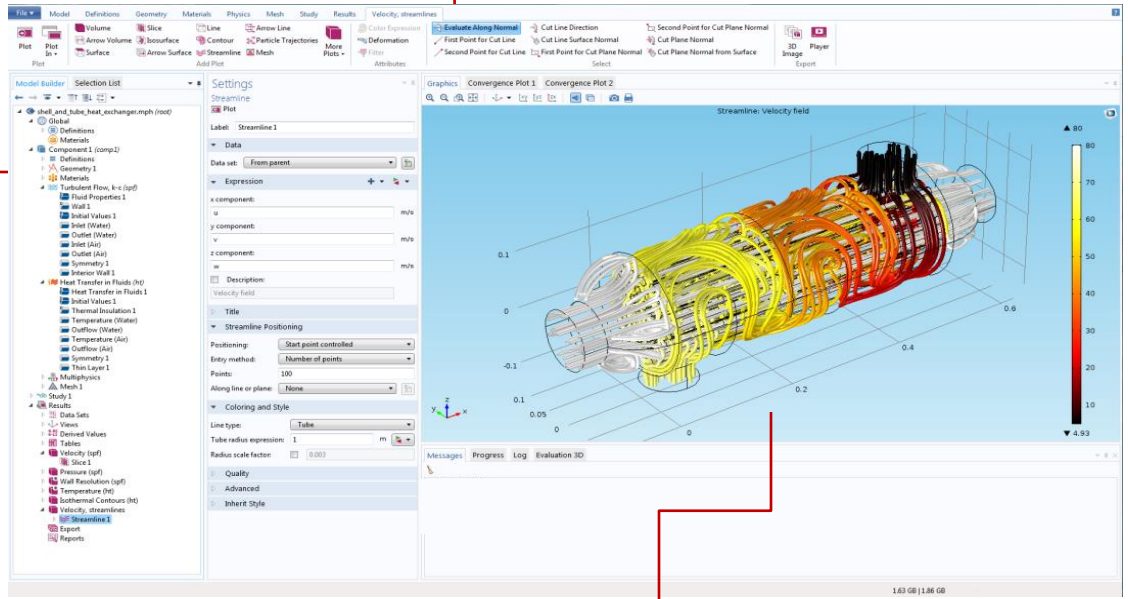
Unique GUI for all physics interfaces

COMSOL Desktop™ provides an integrated environment for simulation and is used for all COMSOL Multiphysics®



Model Builder

Access to all steps in simulation process:

- Geometry modeling and CAD import
- Meshing
- Setting up materials and physics
- Solving
- Visualization
- Postprocessing

Graphics

Fast graphical interface, excellent display and multiple graphics

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Demo Application Builder & COMSOL Server™

Contact Us

- Questions?
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  - Technical Support: support@comsol.com
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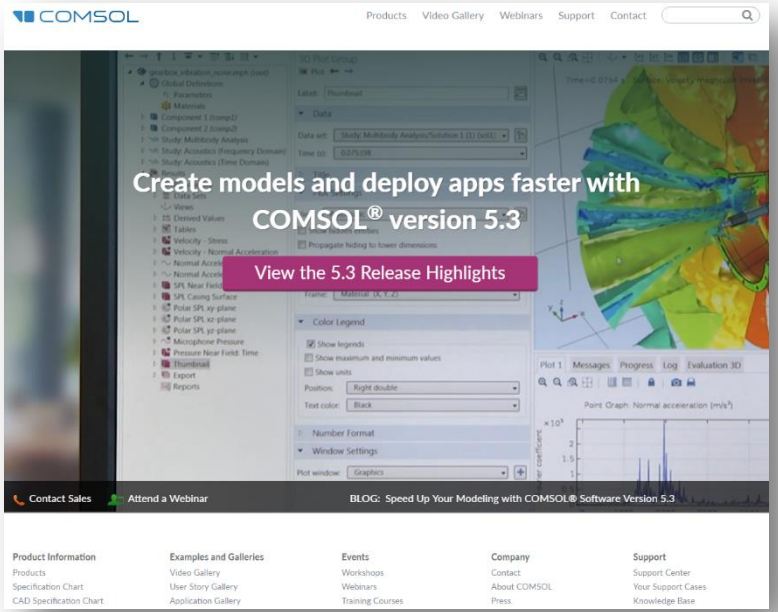

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