Oofelie::FSI *powered by FINE/Hexa*

Oofelie Multiphysics 2010

OOFELIE::FSI, driven by SAMCEF Field and powered by FINE/Hexa, provides engineers and analysts with unique capabilities to ,to analyze Fluid - Structure - Interaction (FSI) systems.

With OOFELIE::FSI, you are getting the core of the physics in one conveniently integrated simulation package.

OOFELIE::FSI powered by FINE/Hexa. This new solution is a Virtual Prototyping tool for the analysis and design of Fluid-Structure-Interaction systems, taking into account thermal effects and turbulence.

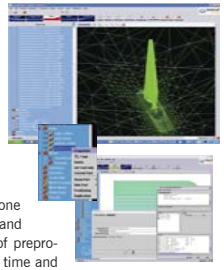
Reduced design time, improved quality and reduced costs are some of the benefits one can now reap from using OOFELIE ::MEMS, driven by SField

MODELING ENVIRONMENT

OOFELIE::MEMS is driven by a user-friendly integrated graphical user interface SAMCEF Field (SF) for the modeling, the analysis and the post-processing of piezoelectric systems.

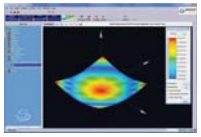
SAMCEF Field, a complete and interactive user environment providing all the tools necessary to design, simulate and analyze a range of configurations, has been tailored to approach efficiently the field of piezo-electricity. Its visual and hierarchically arranged layout will guide you through all the steps of model preparation, resolution procedure and analysis.

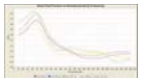
A CAD **modeler**, as well as **import capabilities** from other leading CAD providers, is integrated for modeling and **data preparation**. As data are directly defined on the geometry, users can easily switch system components modeling level from idealized rigid representation to full Finite Element description.



Parameterized data entry is easily done using contextual pull-down menus and pop up boxes using a wide selection of preprogrammed functions for the definition of time and frequency varying properties and boundary conditions.

As soon as the analysis is completed, the results are easily accessible from a simple click in the navigator. Results may be displayed in different forms over the whole model or through user's defined cross-sections to study detailed behavior. In addition to all the state-of-the-art **standard graphic outputs (i.e. X-Y plots, isovalues, animations, etc.),** results may also be inserted in tabular forms in the analysis report. SField is common to all the group of solutions provided by Open Engineering , allowing other analyses to be performed on the same model as for piezoelectric simulations.

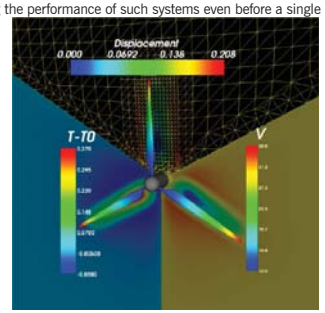




ABOUT OOFELIE::FSI POWERED BY FINE/HEXA

This new solution is a Virtual Prototyping tool for the analysis and design of Fluid-Structure-Interaction systems, taking into account thermal effects and turbulence.

Through the use of its modeling capabilities, it becomes possible to start simulating the performance of such systems even before a single physical



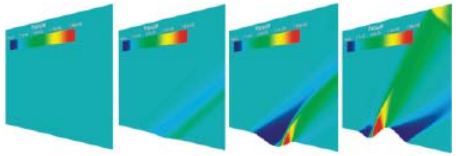
prototype is built.

Reduced design time, improved quality and reduced costs are some of the benefits one can now reap from using OOFELIE:: FSI Powered by FINE/Hexa.

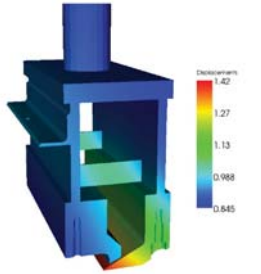
ANALYSIS

F.S.I. solvers consist in the ability to analyze systems where a fluid flow induces forces on a deformable structure, which can then modify the fluid domain and thus the flow itself.

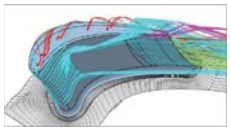
These systems can be studied for steady-state (equilibrium is obtained after a transient phase) and unsteady problems (the structure deformation and the fluid flow are variable in time)



A thermal coupling is also possible, the equality of the temperature and the heat flux being guaranteed at the interfaces between the fluid and the structure. Thermal modifications can induce dilatations or contractions of the structure, and also influence the fluid flow.



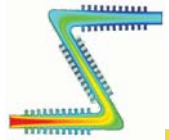
Turbulence in the fluid (small vortices and chaotic behavior) can be modeled to take the vortices influence into account in the solution without computing them.

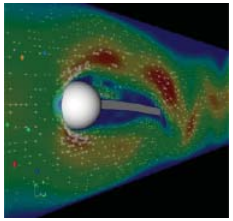


Availibility of several models.

The general, three-dimensional, models offer generalized methods that can be used for many different applications in equipment design and optimization: wind-submitted structures (like wind turbines, flaps) inflatable reentry structures, flexible tanks, fluid-damped structures and MEMS for instance.

Particles tracking can also be performed a posteriori to visualize the trajectories of particles injected in the fluid solution .The particles can simply represent a vector field or be mass particles transported by the





fluid drag (propagation of a poluant?)

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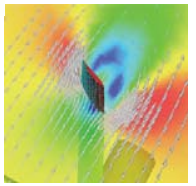

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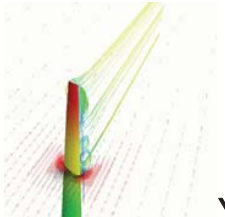

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DREVER TEXTE

DOCUMENTATION

For direct access to information, the Users Guide and Help manual (including many examples) are available

via your favorite navigator (HTML).

PLATFO

OOFELIE:: ven by SAMCEF Windows ar

Open Engineering s.a.
Spatiopôle WSL,
Rue des Chasseurs Ardennais
Tel. : +32 4 372 93 45
Fax : +32 4 372 93 21
info@open-engineering.com
http://www.open-engineering.com