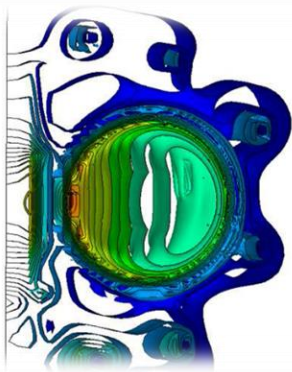




## Solution for cost effective electromagnetic analysis

*F4E and EnginSoft have developed a virtual calculation algorithm for Finite Element analysis to study the electromagnetic behavior of complex and critical ITER components. Providing simplified user interface and strong reduction of computation time and cost, the technology could find applications in in Radio Frequency, EM forming/joining, photonics, optics and microwaves.*



```

ANSYS 14.1
AUG 23 2013
13:44:40
PLOT NO. 1
NEEDL SOLUTION
STEP=2
SUB =1
TIME=2
ESM = (AVG)
ESYS=0
PowerGraphics
EFACET=1
AVRES=Mat
SMN =.319E+03
SMX =1.2749
A =0
B =-.578947
C =-1.15789
D =-1.73684
E =-2.31579
F =-3.47368
G =-4.05263
H =-4.63158
I =-5.21053
J =-5.78947
K =-6.36842
L =-6.94737
M =-7.50632

```

### The technology

Used in fusion to analyse the electromagnetic behavior of the blanket modules (that protect the structure and critical components from the heat and the energy produced by the fusion reactions), the solution provides a virtual calculation algorithm for Finite Elements Method (FEM) analysis based on a proprietary technology embedded in the ANSYS Maxwell software

### Simple user interface and short computation time

In general, investigations using FEM have several benefits such as accuracy, reliability of results and flexibility through custom the models. Nevertheless FEM analysis tend to have a long calculation time and require very specific skills to customize to some phenomena. The solution provides a multiphysics environment that includes a simplified user interface to allow unskilled users to run simulations, and a proprietary algorithms that reduce overall computation time and cost.

### Applications in RF, EM forming, photonics and microwave

Understanding the effects of electromagnetic forces in electronic and mechanical equipment is fundamental to predict its behavior and integrity under operational conditions but also to optimize its design. The Finite Element Method (FEM) is a numerical method used to solve complex calculations in in engineering and physics, particularly to analyze heat transfer, fluid flow, mass transport and electromagnetism. Then, the solution could find many applications in Radio Frequency, EM forming/joining, photonics, optics and microwaves.

### Collaboration opportunities

The technology is available for direct use or towards customization services to adapt the software to the different applications or needs.

*Fusion for Energy*  
 Email:  
[technologytransfer@f4e.europa.eu](mailto:technologytransfer@f4e.europa.eu)