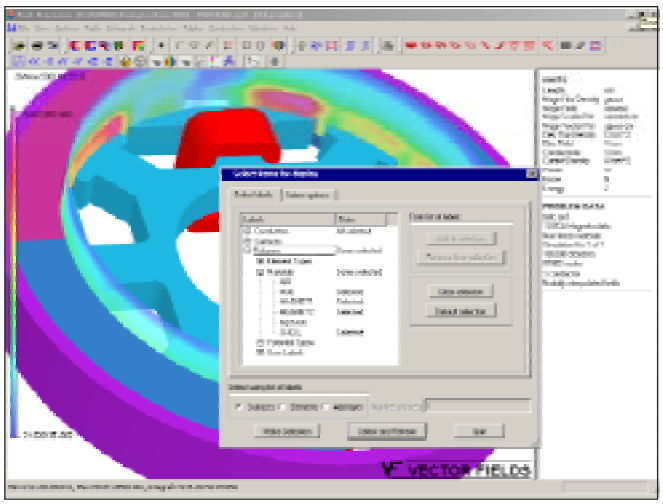
OPERA Version 8.5

includes new interface for the post processor

Introduction

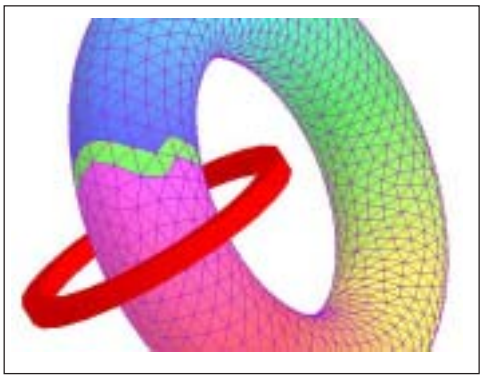
The release of OPERA version 8.5 sees continuing advances in the OPERA suite of software. A new analysis module for solving two dimensional linear motion problems adds to the already powerful OPERA-2d software. The Geometric Modeller, introduced in version 8, has been extended with some new features. In addition, the post processor now uses the same GUI system as the Modeller, which has proved so popular since its introduction. Both model creation, and results visualisation, are now carried out using a state of the art, easy to use, icon based interface.



Easy to use icon and menu interface in the post processor

OPERA-2d Linear Motion

The Linear Motion program (OPERA-2d/LM) is a Transient Eddy Current Solver, extended to include the effects of motion. The solution can have XY symmetry, where motion can be in both X and Y directions. The solution can also have axi-symmetry, where the motion is restricted to motion along the axial Z. The solver also provides for the use of external circuits and coupling to mechanical equations.



Potential cut created automatically by OPERA-3d. Jump in potential is shown around a magnetic torus.

OPERA-2d/LM models make use of a special remeshing technique that requires that the user separates the model into 3 groups of regions: the moving regions, the regions that allow motion and the static sections. During the time-stepping solution process the moving section of the model is repositioned and a reconnection mesh between moving and static sections created.

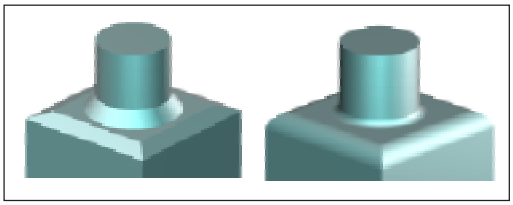
Automatic potential cuts in OPERA-3d

Automatic potential cuts have been implemented for TOSCA. The cuts allow automatic resolution of multiply connected potentials.

In-built pre processor and Modeller routines will correct a TOSCA model that contains multiply connected regions. The software has the capability of checking for multi-valued total magnetic scalar potential regions, and introducing potential “cuts” where appropriate in order to rectify the problem.

Blend or Chamfer in the Geometric Modeller

The facility to blend and chamfer has been included in the Modeller. Two faces joining at an edge can be blended by forming a curved face of fixed radius that joins both faces tangentially. Alternatively, the edge can be chamfered by giving a distance from the edge along each face at which to plane off the edge.



Example of Chamfer (left) and Blend (right) in the Modeller

Other new features in the Modeller include a new cutaway option, allowing the user to cut one body from many. Periodicity can also now be defined in the Modeller for use in TOSCA and SCALA.

Regions of the model can be excluded from the model by giving them a material label of NULL. Any element with NULL material label will not form part of the finite element solution.

OPERA-3d Post Processor

The major enhancement in version 8.5 is the inclusion in the post processor of the same GUI that is used in the Modeller. It is command and icon based, with a similar look and feel under both Microsoft Windows and Unix.

To make use of the new features of the GUI, several commands have changed in the post processor, some new commands have been added, and some have been removed. Commands which operate on a selection of objects (BODY, CONDUCTOR, ENERGY, SELECT and VOLUME commands) have improved facilities for creating the selection before performing their operations.

The HISTOGRAM command has been amalgamated with the MAP command. ZONE and HISTOGRAM contour maps are displayed with translucent colours so that parts of the model behind the map show through.

Full details of all the new features are included in a New Features document, issued with the software release. They are also fully documented in the updated manuals, available electronically on the distribution CD.