

Display of isolines, streamlines, particles; data probe; integrated calculator; export in png and PostScript format: here are some of the features available in our products.

### **Data Structure**

- Structured, unstructured and hybrid meshes
- Scalar, vector and symmetric tensor fields
- Non-restricted number of solution fields

### **File Access**

- Reading of compressed files (z,Z,gz,bz)
- User-transparent file transfer through the following protocols: http, ftp or vu (VU protocol)
- User-transparent transfer of data being calculated or visualized, onto another computer

### **Regions**

- Cutting planes according to the domain origin (X,Y,Z)
- Cutting planes at arbitrary orientations, indicated by the user or modified interactively
- Cutting spheres or cylinders
- Display of the intersected elements or of the cutting plane in those elements
- Mesh curvilinear lines or surfaces (I,J,K)
- Isosurfaces of a variable or of a mathematical expression of a secondary variable
- Domain boundaries
- Injectors (points and 1D, 2D or 3D rakes)
- Sweeping between two cutting planes, two curvilinear surfaces or two isosurfaces

### **Integrated Calculator**

It is possible to combine the various solution fields for the creation mathematical expressions, and to ext

- Mathematical expressions to indicate values for:
- isolines and isosurfaces
- color mapping
- particle radius
- vector field components
- deformation
- scaling factors
- data extraction
- etc.

- Expressions made from variables, constants, functions, as well as relational and conditional operators
- Mathematical functions corresponding to the libm.a library
- Calculation of elements volumes
- Calculation of continuous variables from Taylor-type discontinuous variables
- Calculation of total derivatives and partial derivatives
- Calculation of the stream function for 2D domains
- New expressions entered by the user can be saved for subsequent use

### Mesh

- Selection of blocks
- Display of nodes and elements numbers
- Varied colors for the different blocks
- Visual shrinking of the elements (elements can be made smaller when displayed)
- Elimination of the mesh internal surfaces

### Isolines and isosurfaces

- Isosurfaces of any variable or expression
- Isolines of any variable or expression, on any 2D support
- Display of the value of each isoline or isosurface
- Output of values to a file

### Graphs

- Surfaces in color gradation
- Shading (uniform or according to Gouraud algorithm)
- Color mapping (constant or variable by element)

### Streamlines and Particles

- On-the-fly calculation and interactive control of the injection
- Displayed as lines/tubes and spheres
- Control of the calculation accuracy, graphical display interval, injection interval, and life span
- Size of the particle according to a variable or expression
- Integration across the boundaries of blocks or meshes
- Injection from points, lines (rakes), surfaces or cubes (points, circles, discs, spheres), from arbitrary shapes
- Interactive modification of injection positions
- Color mapping according to a variable or an expression, or varied, according to the injection position

### Vectors

- Displayed as arrows or cones
- Vector size according to the probed variable
- Size control (scaling factor or normalized length)

## Tensors

- For second order symmetric tensor field, in 2D or 3D
- Calculation of the tensor's main axes at the nodes of the mesh
- Display of the eigenvectors as axes or ellipsoids
- Normalization by the eigenvalues

## Data Probe

- Quantitative extraction in 0D, 1D, 2D or 3D
- Interactive probe on the screen
- Extraction of the node and element numbers, coordinates and value of each variable
- Redirection of values to gnuplot for graphic display
- Facilitation of the first steps for the development of simulation programs
- Output to a file to specify initial conditions for a subsequent simulation, or for comparison purposes

## Geometry

- Nurbs or simple curves and surfaces
- Precise selection of the geometric elements to be displayed

## Chemistry

- Atoms and bonds colored according to the standard chemistry representations
- Automatic display of bonds according to the van der Waals radius
- Display of the atoms according to the covalent or the van der Waals radius
- Visualization of molecular surfaces

## Animation

- To study transient phenomena, to follow the evolution of an adaptive mesh or to illustrate the parameters
- Reading and animation of files with 3D images instead of 2D projections: rotation, translation and zoom
- Interactive control of the animation
- Saving of the animation in high quality PostScript files or ppm
- Direct saving of the animation in a mpeg file

## Display Features

- No internal limit on the number of images that can be displayed simultaneously
- Multiple displays of the same image with rotation and translation, to mirror axisymmetric data or to compare different views
- Thresholding to accurately select the values to be displayed
- Color mapping and transparency (constant, or according to a variable or an expression)
- Elimination (culling) of the domain's front or back faces
- Offset of the image (displayed at a certain distance from the probe)
- Deformation (elevated surface) adjustable according to any variable or expression
- Offset and deformation done independently on the three axes (X,Y,Z)

## Image Output

- Portable Network Graphics (png), for insertion in web sites or documents
- Vector PostScript (screen-resolution independent), or matrix (bitmap) PostScript, for insertion into documents
- Portable pixmap (PPM). Can be used to create images in tiff, gif or other format
- mpeg video