Visual Workshop

Visual Workshop is the ANSWERS® product designed to prepare and verify models, launch jobs and visualise results for the MONK®, MCBEND®, RANKERN® and WIMS® codes. It allows the user to:

- Display a 3D wire frame or 2D/3D ray traced image of a fractal geometry (FG) from a MCBEND®, MONK® or RANKERN® model and to display other input features such as tally bodies/meshes, scatter/reflect bodies, importance mesh and dose points, forced flight interfaces, multiple definitions and undefined volumes.
- Display 2D and 3D geometries from a WIMS® input.
- View and edit the input model data with the built-in editor containing syntax colouring, error checking and keyword auto-complete.
- Search for installed code versions and libraries on the local system, run and monitor calculations and view output files.
- Visualise the results of a calculation.
- Investigate the uncertainties of a parameterised model.
- Optimise a model for specific result values.

Geometry Display

Visual Workshop includes multiple graphical views each with different features and functionality. All of the views are interactive allowing the analyst to easily navigate the model and provide feedback about the model co-ordinates and composition under the cursor.

Additional code dependent features can be displayed on top of the model geometry; these include Source bodies, Dose points, the Importance mesh, Scoring meshes, Forced Flight interfaces, Scatter/Reflect bodies and particle tracks.

The 2D and 3D ray trace views use the same routines to generate their images as the analysis codes use to run the Monte-Carlo calculations. This gives the analyst a high level of confidence that the model being displayed is an exact representation of the model used for the calculation.

These displays can automatically detect and indicate errors in the model such as undefined or multiply defined volumes.

The ray trace views also allow for the creation of measurement lines which enables production of images with dimensions for inclusion in reports. The 3D ray trace view additionally allows individual materials or volumes can be selectively included, excluded or rendered transparent.

Editing Models

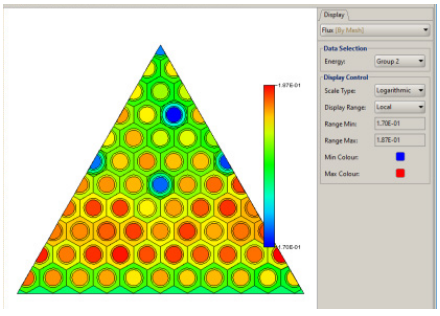
Visual Workshop contains a text editor which can be used to edit loaded models and view output files. The editor contains various features designed to assist the user when editing models, including:

- Syntax highlighting of items including comments, keywords, numbers and parameters.
- Code and comment folding. The editor can fold blocks of comments and complete input units/modules in the input file.
- Auto-complete functionality. Auto-complete entries include unit/module titles, blocks of geometry input, common keywords, parameter names and control commands.

Running Calculations

When Visual Workshop starts it scans the local system for installed ANSWERS® codes and nuclear data libraries and can decide which nuclear data library types are required in order to run a loaded model.

Visual Workshop can run both the serial and parallel versions of ANSWERS® codes, either running locally or submitting into an existing HPC scheduling system. For suitable models, Visual Workshop can split a calculation into multiple parts that can be run concurrently across available processor cores. This is especially useful for calculations that may require many runs, such as looping, optimisation and uncertainty quantification cases.



Visual Workshop window showing 2D WIMS results display, model navigation window and syntax colouring editor.

Results Display

Visual Workshop has a number of ways in which a user can visualise the results of a calculation. Many results can be displayed overlaid on the model geometry in either the 3D Wireframe or 3D Ray Trace graphical views. Different display types are available which are highly customisable by the user.

All results that Visual Workshop can extract from an output file can be plotted using built-in chart functionality.

Uncertainty/Optimisation Calculations

The Visual Workshop Uncertainty Tool allows the user to investigate the uncertainties on physics results arising from the uncertainties on the input parameters, as defined by their probability distribution functions (PDFs).

Given a parameterised input file where one or more parameters have been selected for uncertainty analysis and the statistical distributions to be used for these parameters, the Uncertainty Tool will then vary the selected parameter(s) to create a set of input files that are used to execute multiple runs of the calculation, each with a different version of the input.

Results of interest are specified to allow the Uncertainty Tool to extract their values from the created output files.

The Visual Workshop Optimisation Tool is able to run multiple versions of a parameterised input file in order to identify parameter values which produce a specified result value.

Multiple modes of operation are available which can either vary one or more selected parameters in order to produce a selected target result or can run a selection of different parameter values to identify the contours within a selected parameter space which produce a target result.

Contact

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