

Nuclear Science and Technology Division

GeeWiz Integrated Visualization Interface for SCALE 5.1

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The Standardized Computer Analyses for Licensing Evaluation (SCALE) project team at Oak Ridge National Laboratory has developed an integrated graphical visualization package for KENO V.a and KENO-VI. This package uses the SCALE Graphically Enhanced Editing Wizard (GeeWiz) as the visualization control center that provides users access to

- point-and-click input menus for KENO input setup,
- KENO3D interactive three-dimensional (3-D) geometry visualization tool,
- Javapeno (Java Plots Especially Nice Output) interactive two-dimensional and 3-D data plotting code, and
- HTML-formatted KENO V.a output.

GeeWiz and KENO3D are compatible with KENO V.a and KENO-VI in SCALE 5.1 and run on Windows personal computers. Javapeno is a Java application that runs on multiple computing platforms, including Windows, Unix, Linux, and Mac. GeeWiz, KENO3D, and Javapeno provide pull-down menus, toolbars, and context-sensitive help to guide users.

GeeWiz is the graphical user interface that serves as a “command center” for SCALE users. It assists users in setting up, running, and viewing results for CSAS/KENO V.a, CSAS6/KENO-VI, TSUNAMI-1D and -3D, TRITON/KENO V.a, TRITON6/KENO-VI, STARBUCS, and SMORES cases from an integrated user-friendly environment. It is integrated with KENO3D, Javapeno, and the KENO V.a HTML output.

The GeeWiz link to KENO3D allows users to view the components of their geometry model as it is constructed. Once the input is complete, the user can click a button to run SCALE and another button to view the output. Another button in GeeWiz launches Javapeno to plot data calculated by KENO V.a/KMART, KENO-VI/KMART6, or TSUNAMI-3D/SAMS including groupwise reaction rates, fluxes, and cross-section sensitivities by geometry region. KENO3D can also superimpose the calculated results on the 3-D image.

An advanced HTML-formatted output interface for KENO V.a has been developed as part of the integrated visualization package. HTML can be viewed in any of several modern Web browsers that are freely distributed and are preinstalled on many computer systems. Most computer users are familiar with Web site navigation and require no special training to use the new output format. HTML presents a wide variety of formatting options for differing fonts, colors, and data tables. More advanced technologies such as Java applets and JavaScript are readily incorporated into the output for advanced navigation and data visualization. In addition to easily navigated and color-coded tables of data, interactive plotting capabilities are available. A version

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of Javapeno has been developed that executes within the Web browser as a Java applet. Javapeno-compatible data files are created by KENO V.a. so that the user may view data in colorful, interactive, and customizable plots. Data available for plotting within the HTML interface include k-eff by generation, the distribution of k-eff values, flux spectra by region, and fission and absorption rates by region.

The SCALE integrated visualization package for KENO marks a new step forward in using current visualization technologies for Monte Carlo analyses. With the implementation of this package, it is possible for a user to set up, execute, and view results from KENO in a friendly, colorful, and interactive computing environment without ever using a text editor.

This poster presentation will feature a live demonstration of these features in GeeWiz and SCALE 5.1.