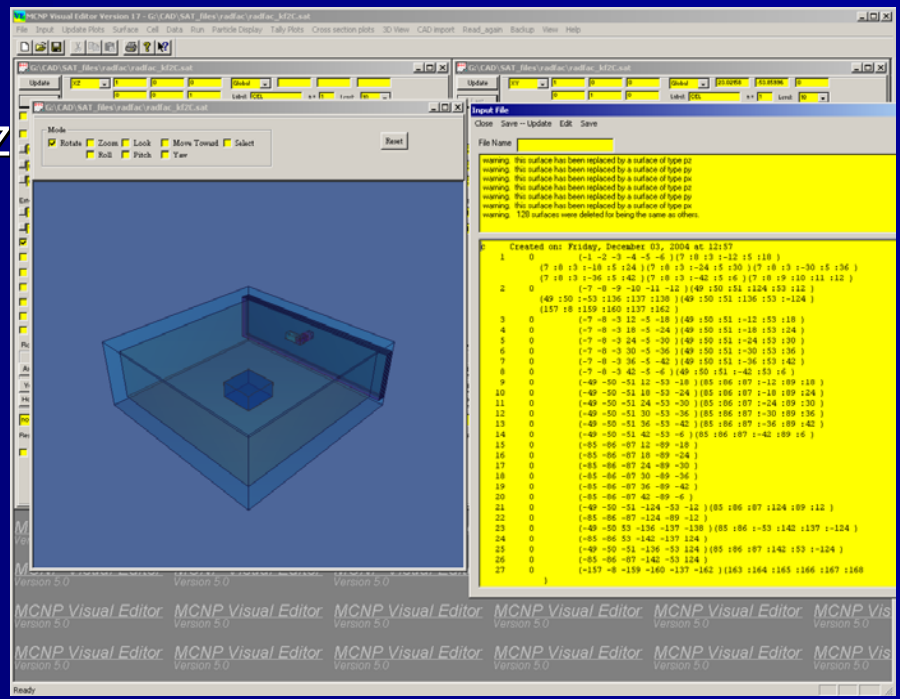
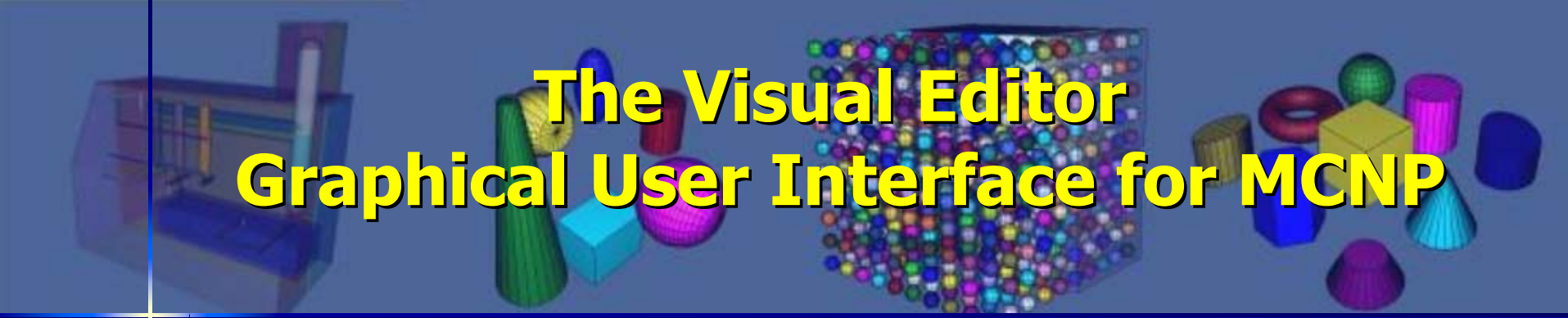
Wizards and Visualization Features for MCNP Geometries and Sources

The American Nuclear Society's 14th Biennial Topical Meeting of the Radiation Protection and Shielding Division, Carlsbad New Mexico, USA. April 3-6, 2006

R. A. Schwarz and A. L. Schwarz
Visual Editor Consultants

L. L. Carter
Carter M. C. Analysis





The Visual Editor
Graphical User Interface for MCNP

- Display Geometries with 2D and 3D views
- Create geometries
  - Universes, fills, lattices
- Some support for data cards
  - Materials, transformations, importances
- Plot particle tracks
  - SDEF Source generation points
  - Collision points
  - KCODE source point generation
- Tally and Cross section plots
- CAD Import

How the Visual Editor works

- Visual C++ code is linked to the MCNP Fortran code.
- The Visual Editor Fortran modifications are now a part of the LANL Version 5 Fortran code.
- The C++ and Fortran share data and memory.

Purpose of the Visual Editor

- Make it easier to create MCNP input files.
- Generate input files faster with fewer errors.
- Saves time.
- Saves money.

Version 1.4 released to RSICC

Radiation Safety Information Computational Center
Oak Ridge National Laboratory

&Data | Ordering | eNotebooks | Workshops | News | Rsicc WWW's

MCNP5 1.40 and MCNPX 2.5.0 Now Available

The new MCNP/MCNPX package can now be ordered from RSICC. It includes both MCNP5 1.40 and MCNPX 2.5.0. It also includes all publicly-available data libraries supported by Los Alamos Group X-1 and a new version of VISED for use with MCNP5. The package is distributed only on one DVD and is available free to all approved requesters for a limited time.

See the code abstracts and data info page:

http://rsicc.ornl.gov/codes/ccc/ccc7/ccc-730.html

Click below and complete the online order form to request the package. If you are not registered as a RSICC user, or if your registration form needs updating, please do that first. Don't forget the last step in the ordering process, which is to print and fax (or mail) the software license and export control agreement. Your request will not be processed until these forms are received.

http://rsicc.ornl.gov/rsiccnew/order.htm

The package is distributed on a single DVD in Windows and UNIX formats. The executable-only package CCC730MNYCP01 includes executables for PC Windows, PC Linux, some Unix systems and Mac OSX; MCNPDATA; test problems and the referenced documentation. The CCC730MNYCP00 package includes the items listed above plus source codes, makefiles, build scripts, and some additional documentation. Export control regulations restrict the distribution of Fortran source code. If restrictions apply, RSICC will send the executable-only version. Please order the package you prefer, and we will honor your preference if possible.

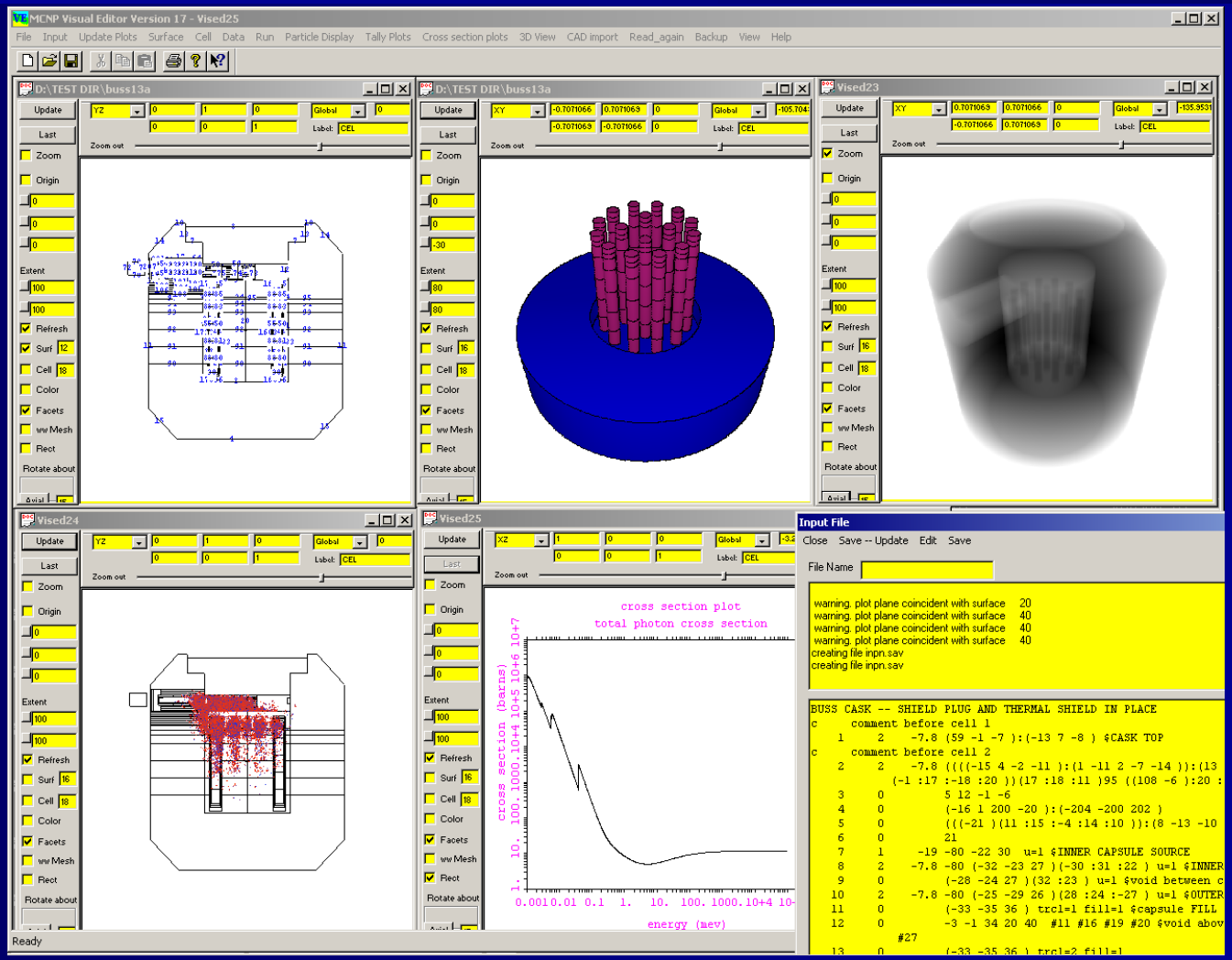
Follow links to release notes for details on changes in the codes:

MCNP5
"MCNP 5.1.40 RSICC Release Notes," LA-UR-05-8617
http://www-xdiv.lanl.gov/x5/MCNP/index.html

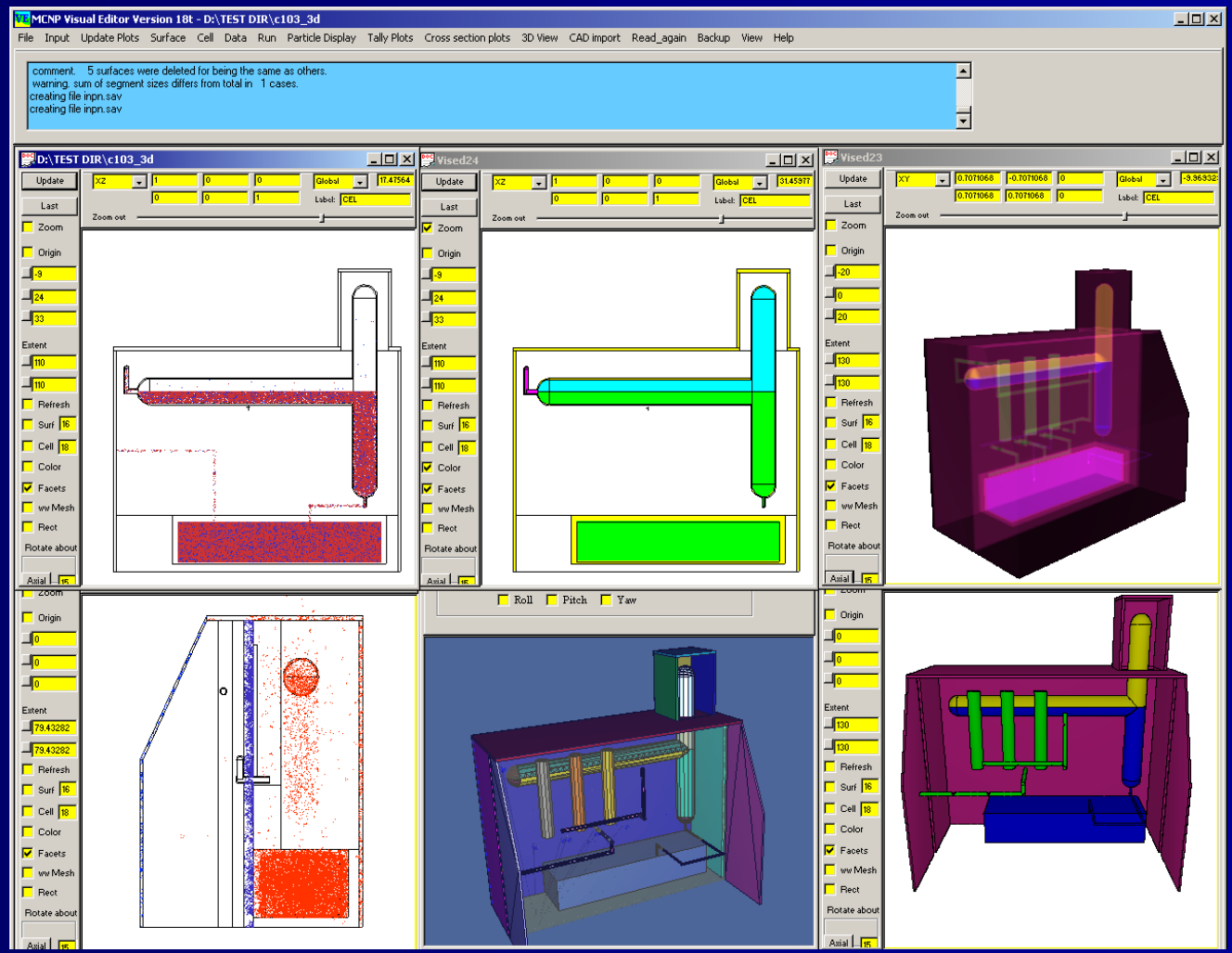
MCNPX
"MCNPX Extensions, Version 2.5.0," LA-UR-05-2675

Free to all approved requesters

Complete Interface for MCNP

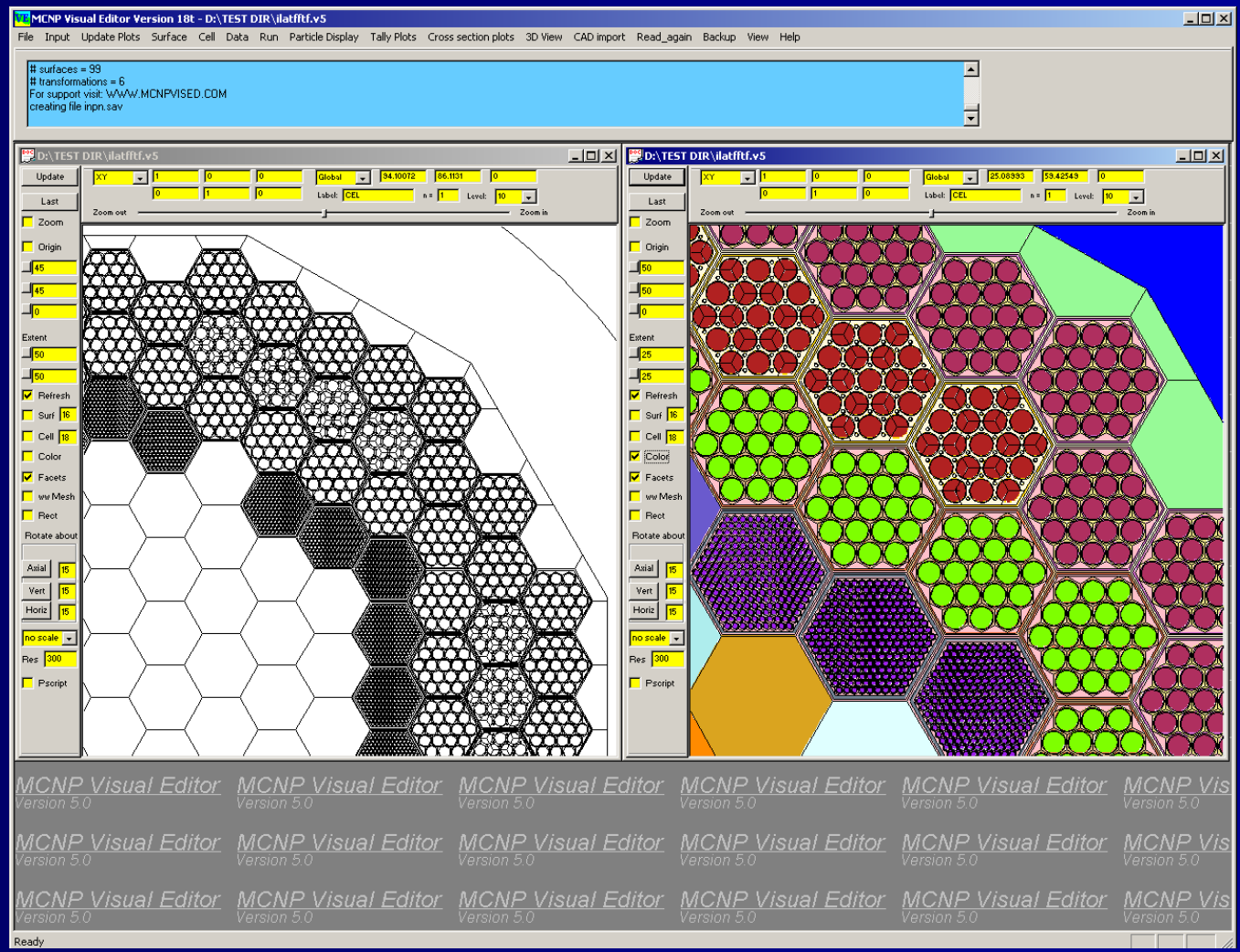


Complete Interface for MCNP



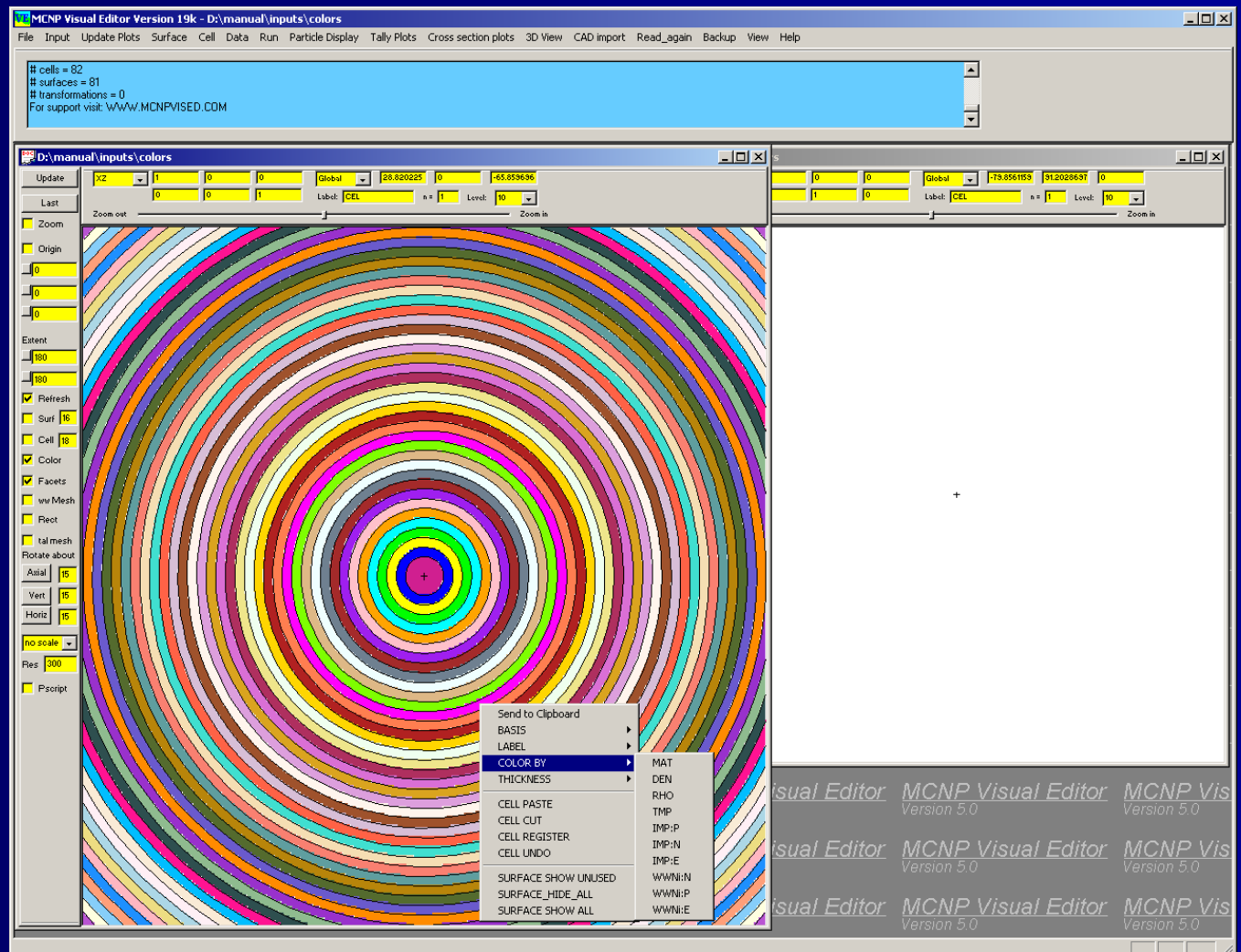
Visual Editor Capabilities

Geometry Display



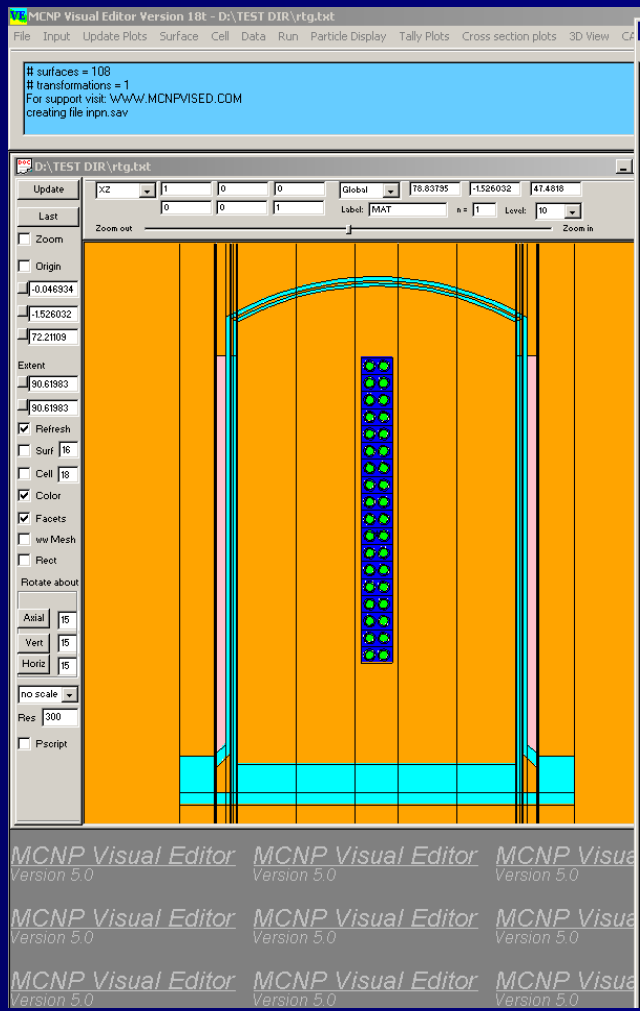
Visual Editor Capabilities

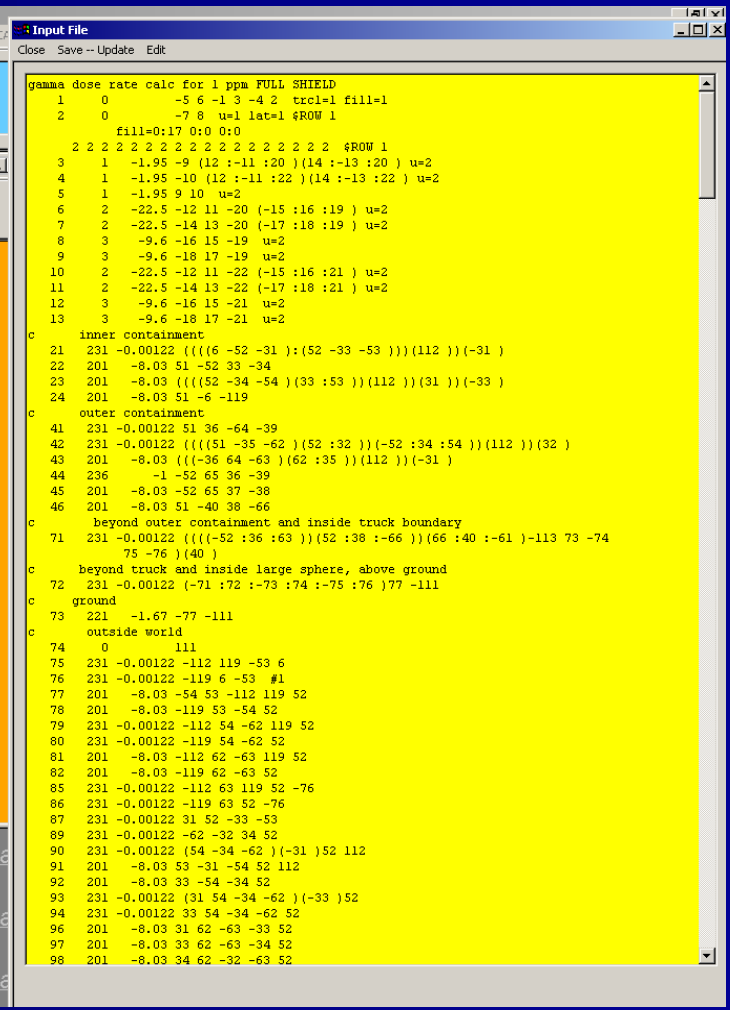
Colors



Visual Editor Capabilities

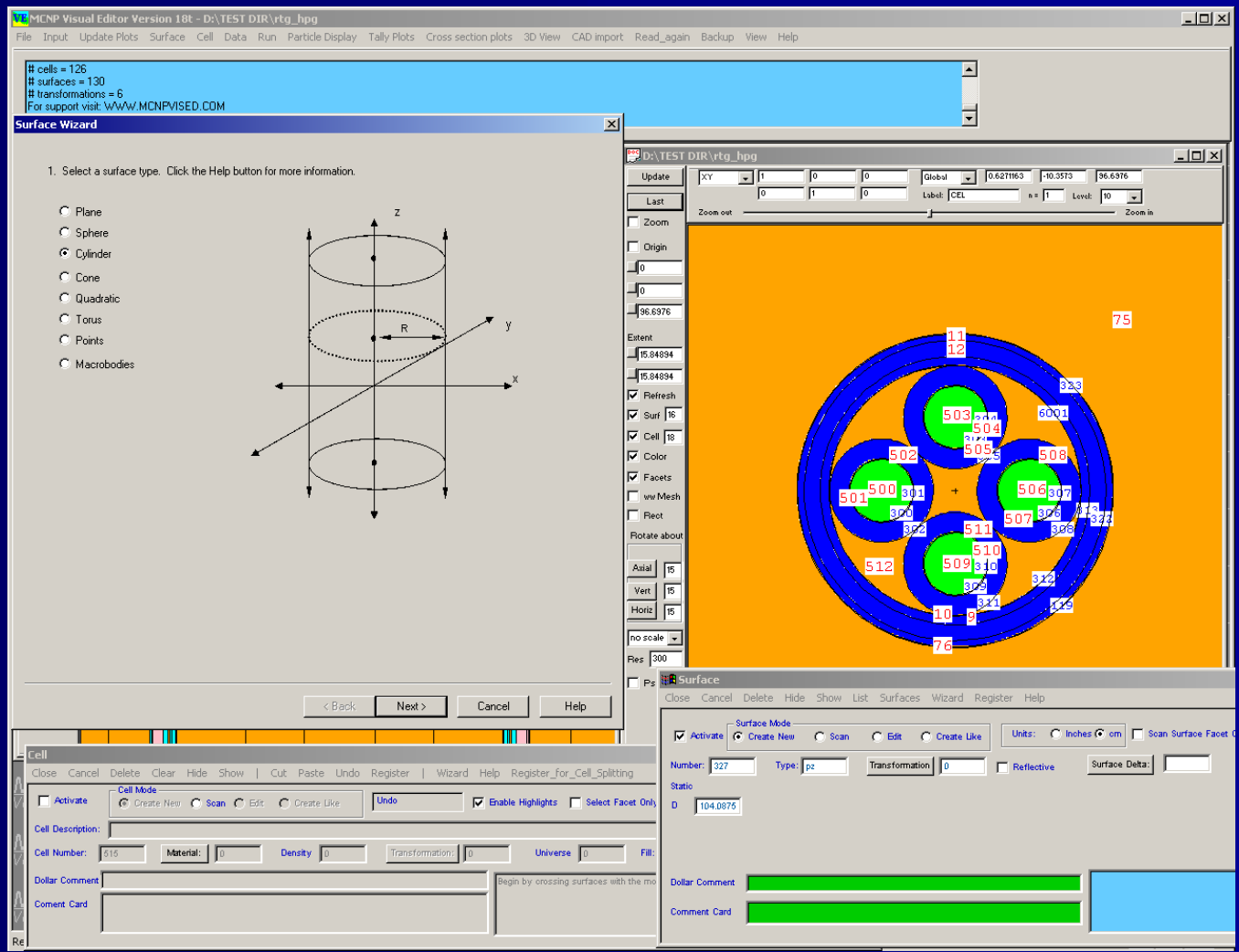
Input File Available





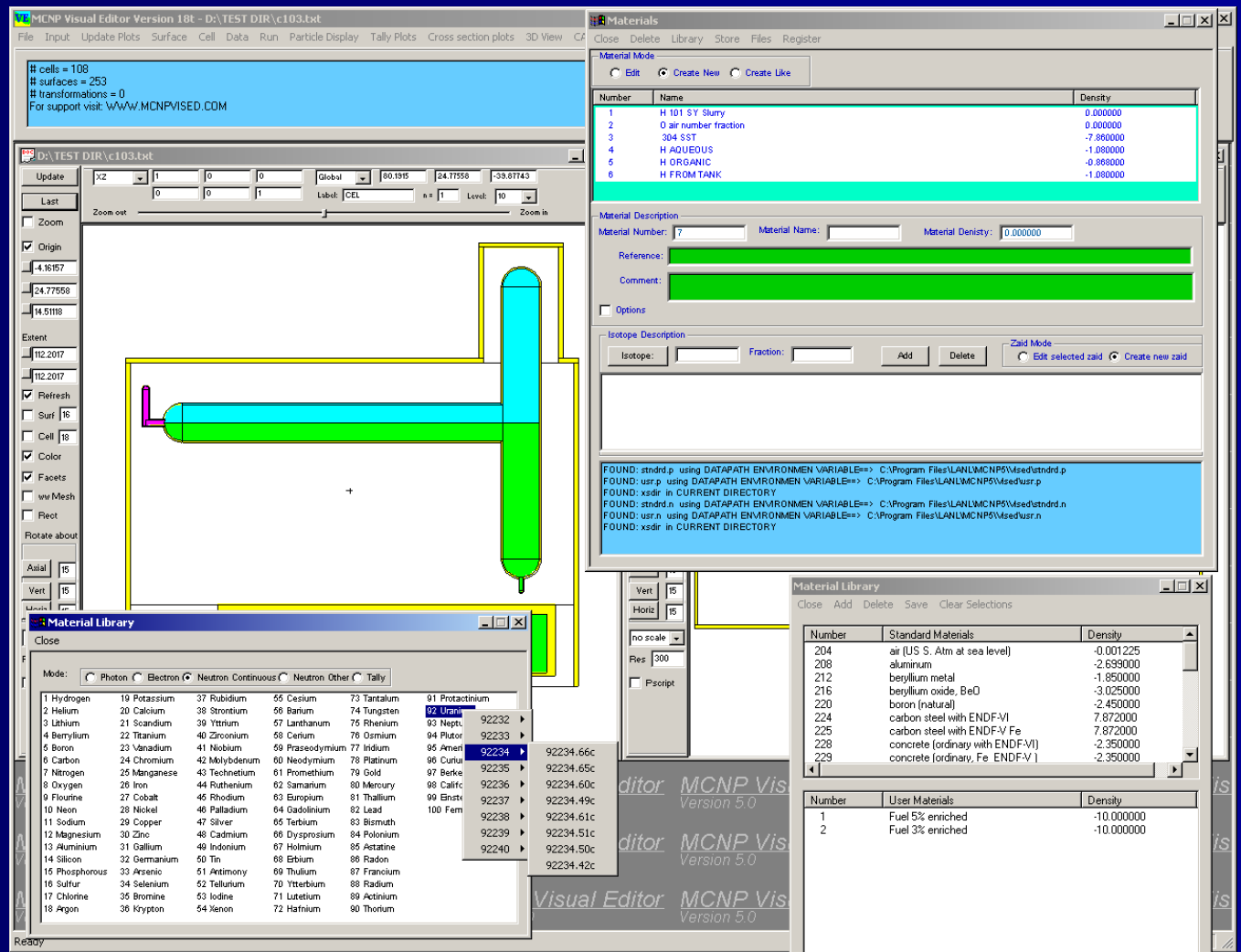
Visual Editor Capabilities

Surface Wizard



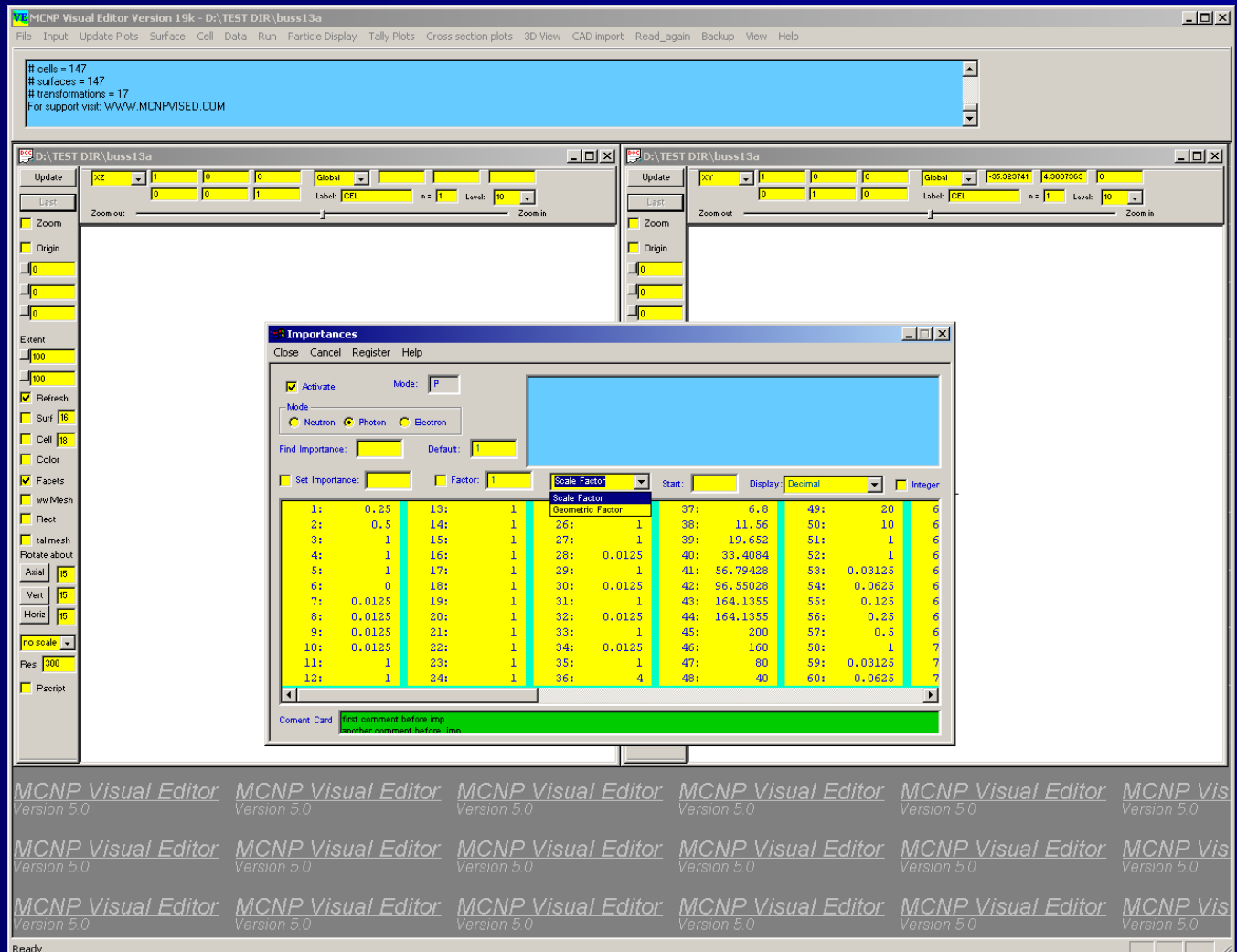
Visual Editor Capabilities

Materials



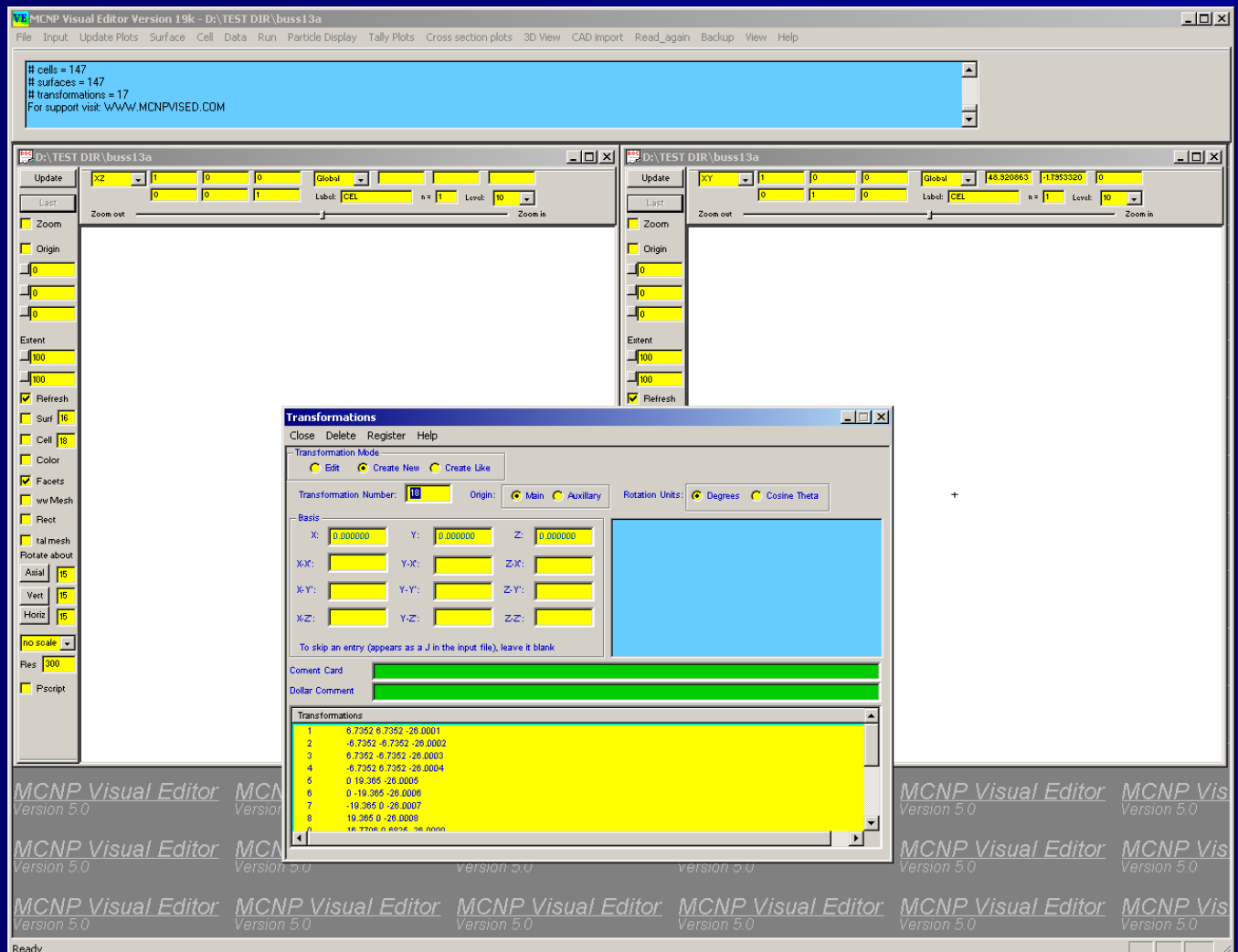
Visual Editor Capabilities

Importances



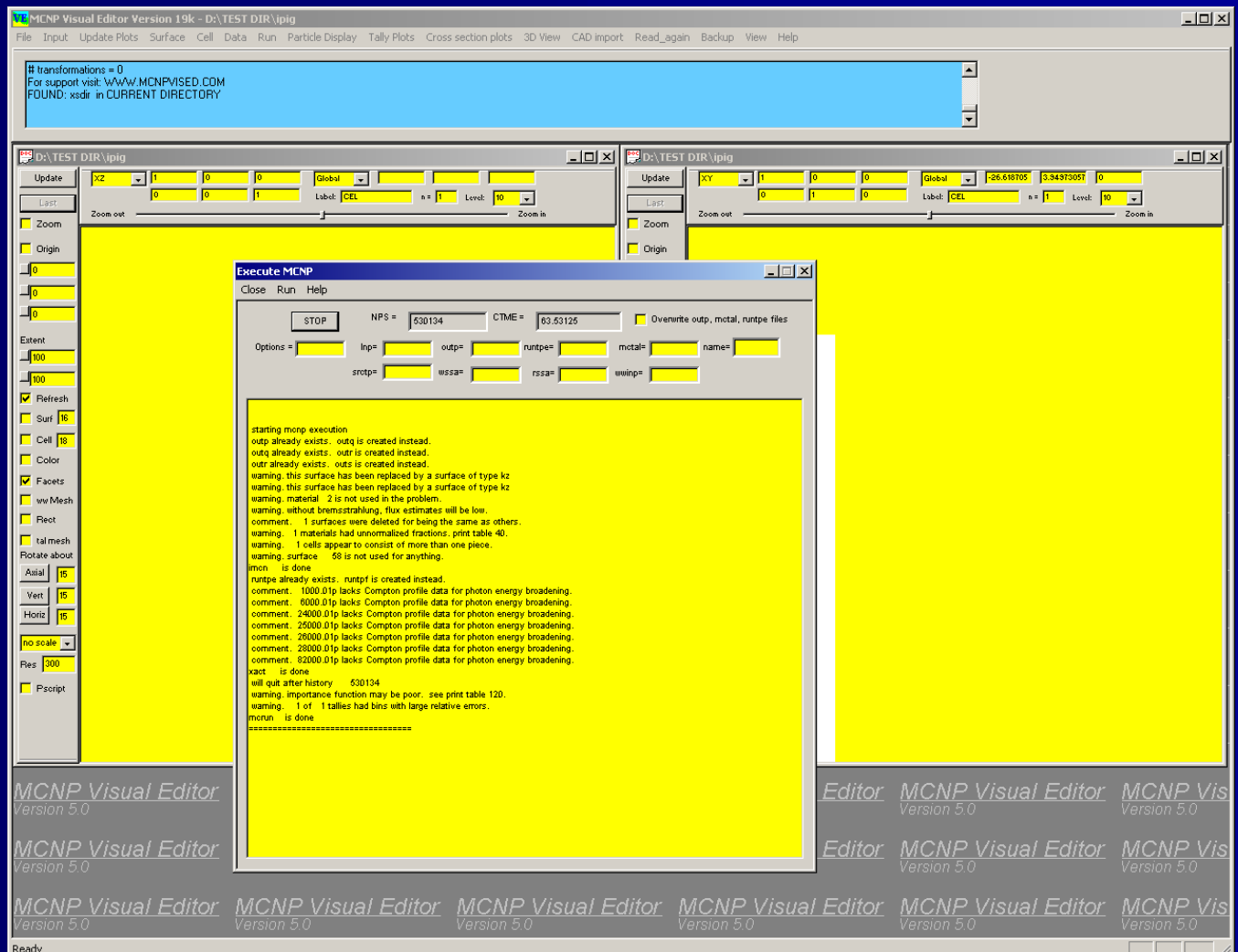
Visual Editor Capabilities

Transformations



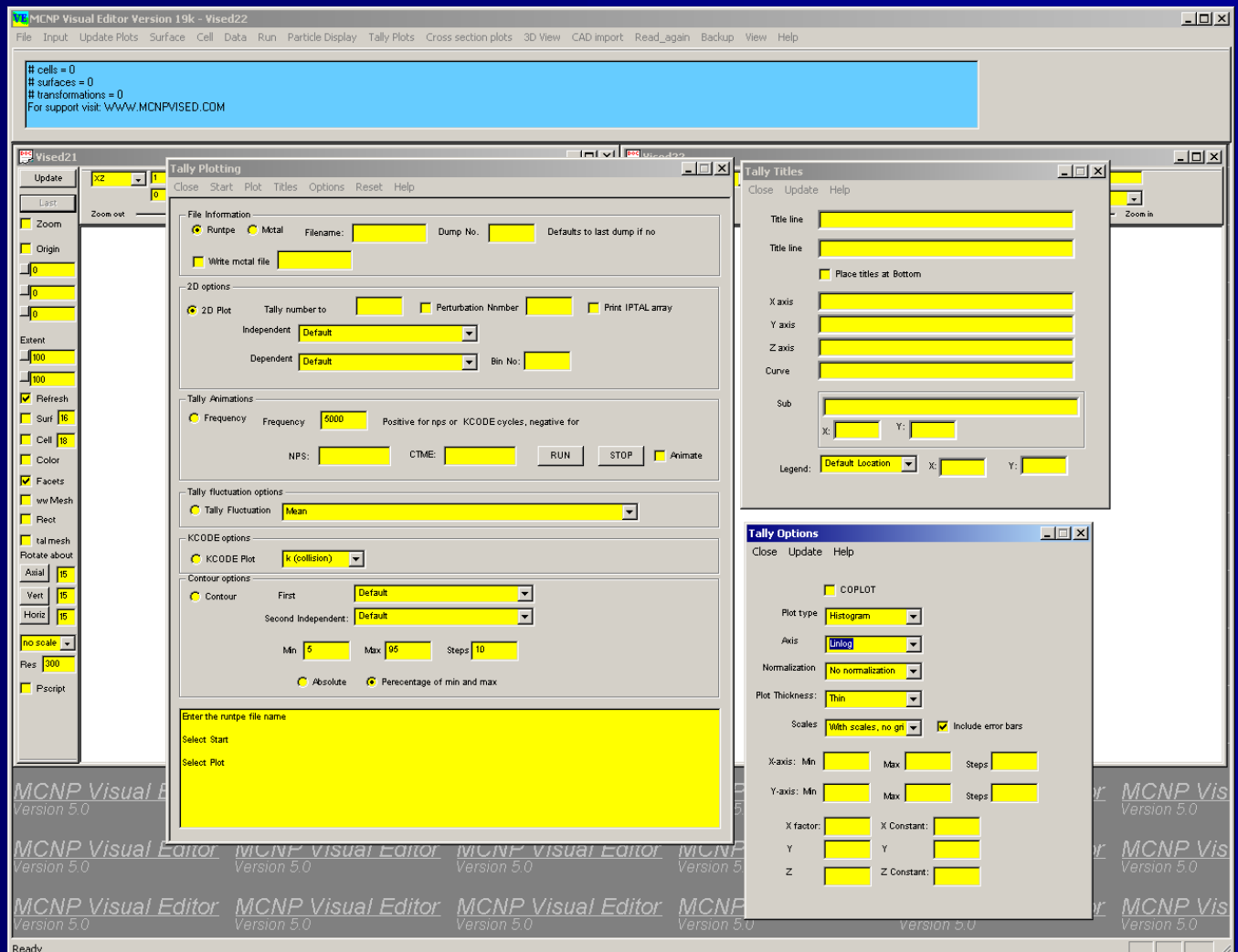
Visual Editor Capabilities

Running



Visual Editor Capabilities

Tally Plots

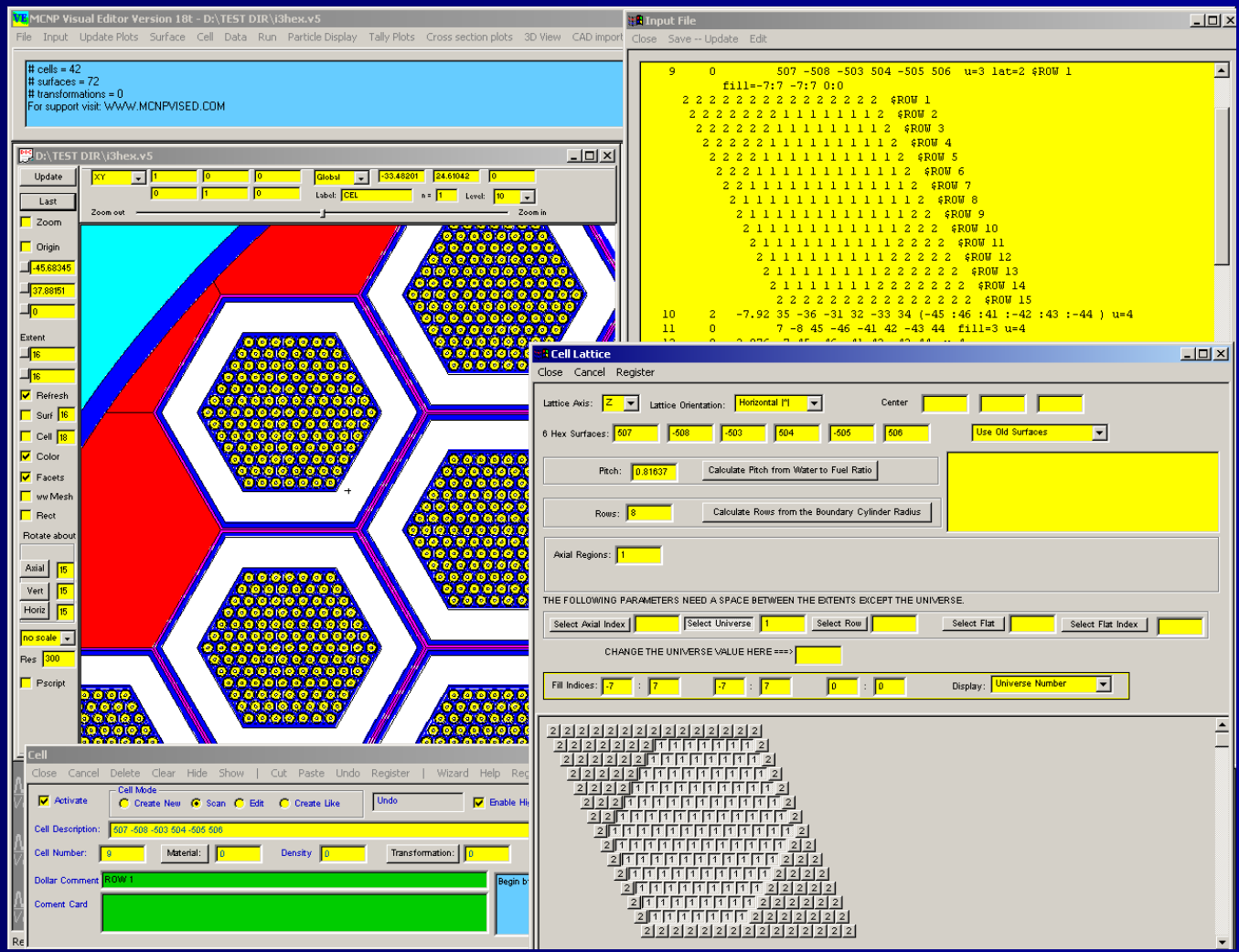


Visual Editor Capabilities

Cross Section Plots

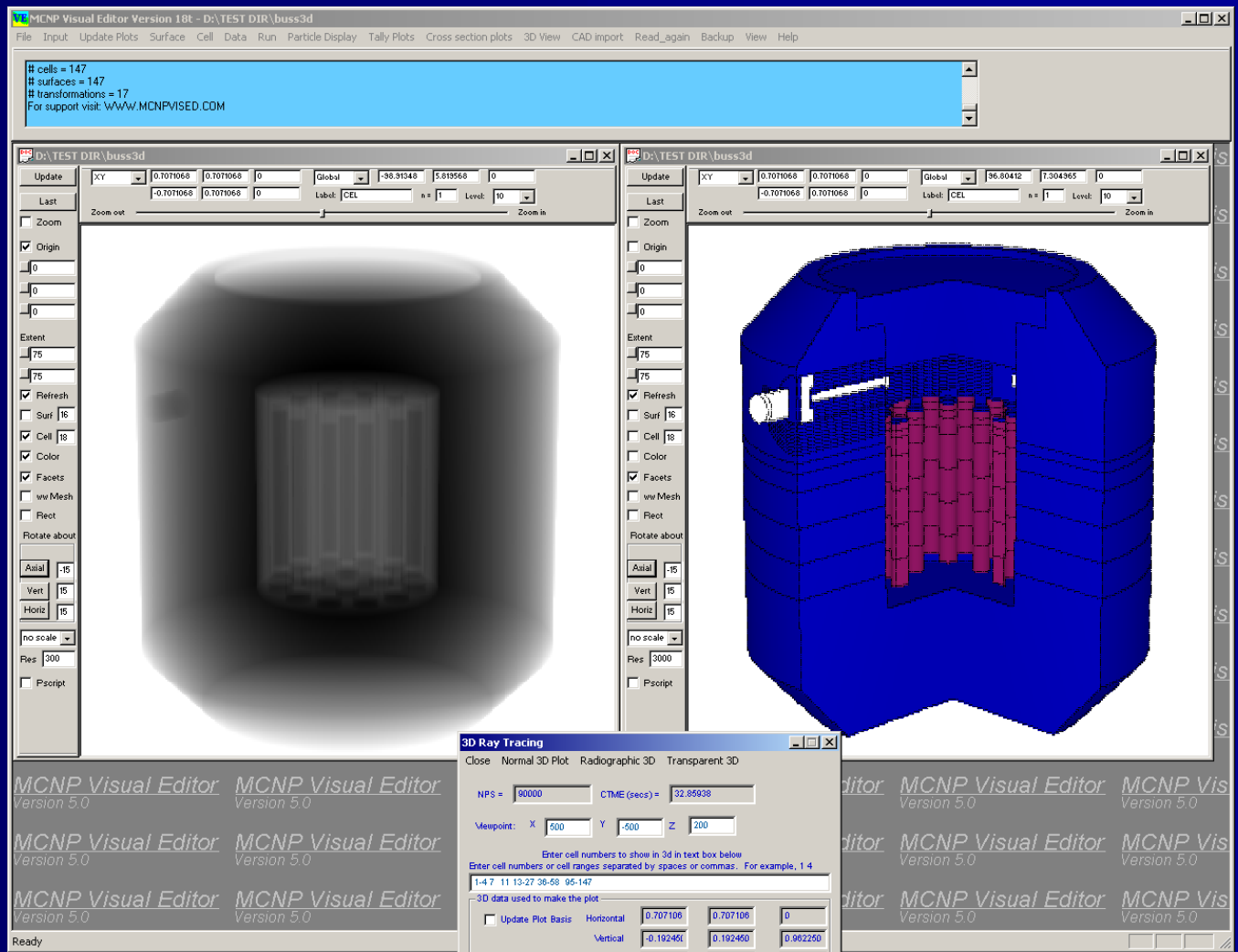
Visual Editor Capabilities

Lattice Display/Creation



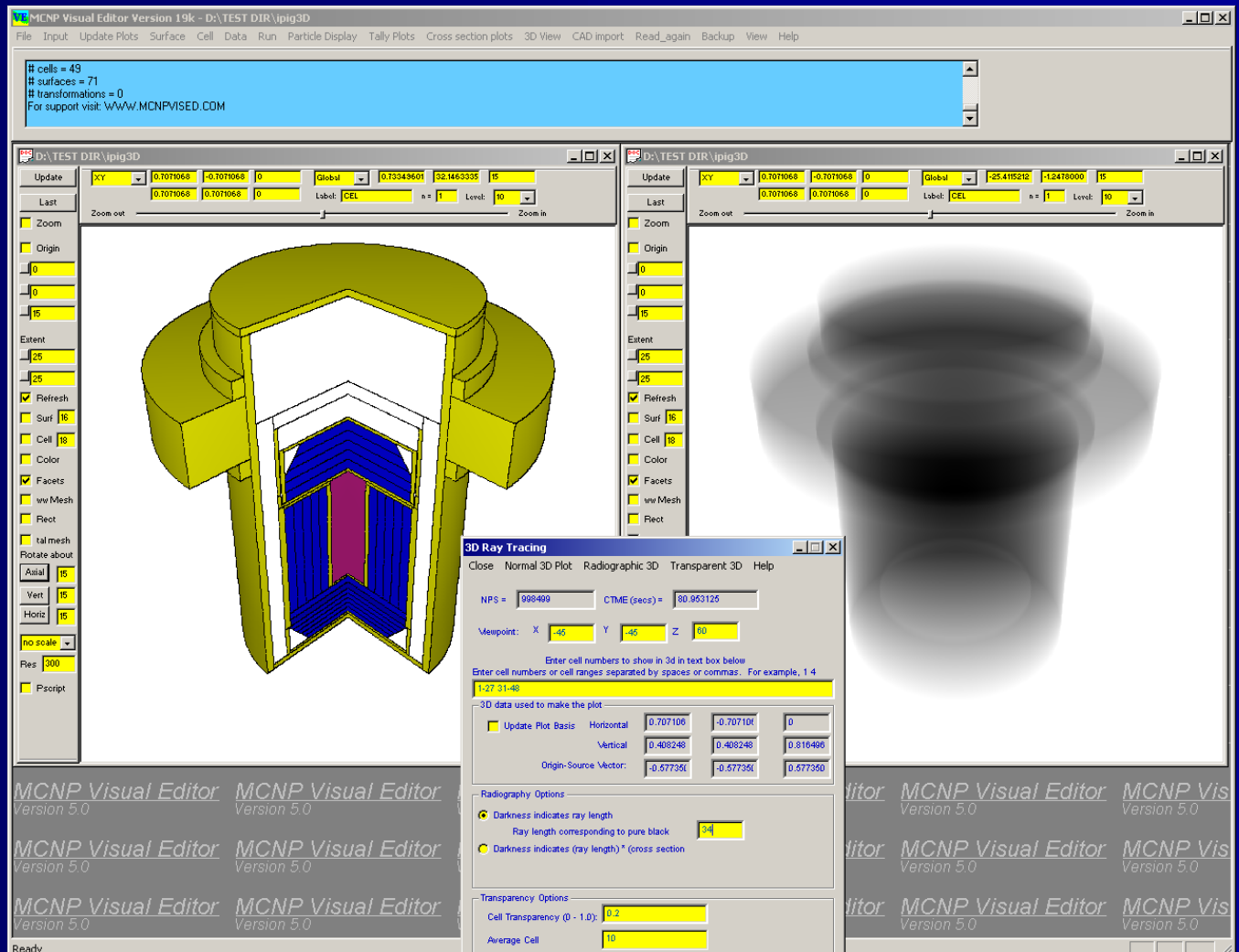
Visual Editor Capabilities

3D Ray Traced Imaging



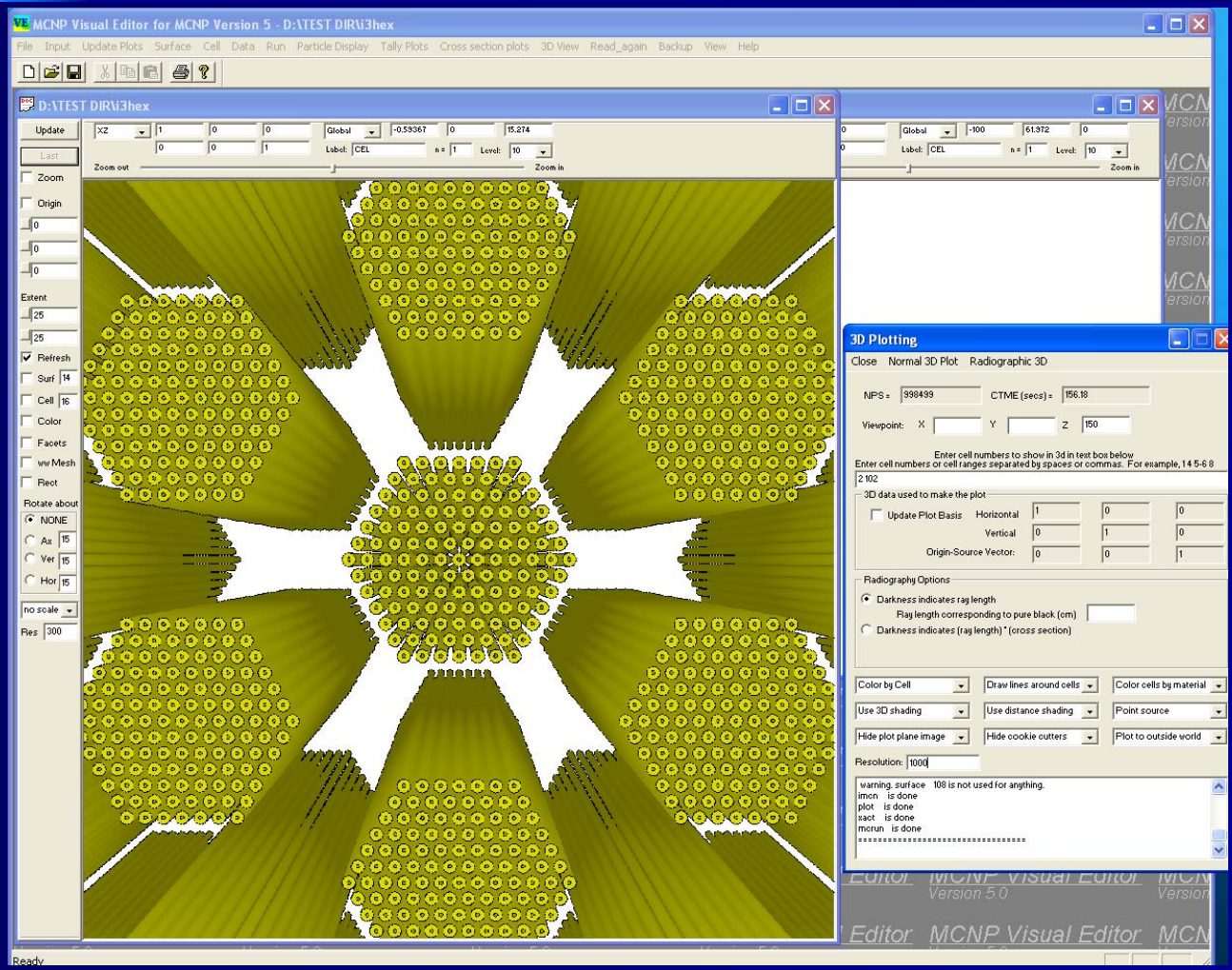
Visual Editor Capabilities

3D Ray Traced Imaging



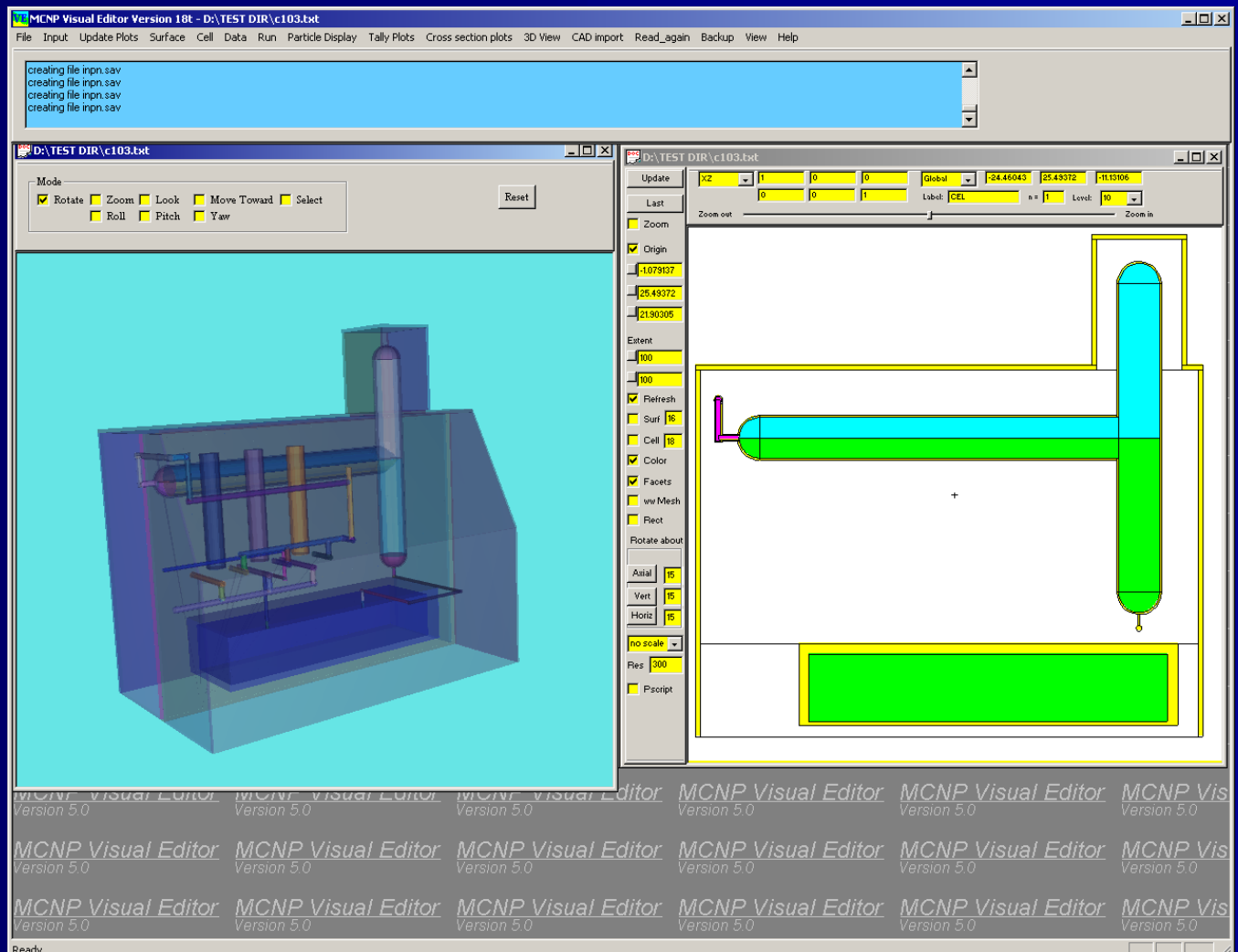
Visual Editor Capabilities

3D Plots of Lattice Geometries



Visual Editor Capabilities

Dynamic 3D Display



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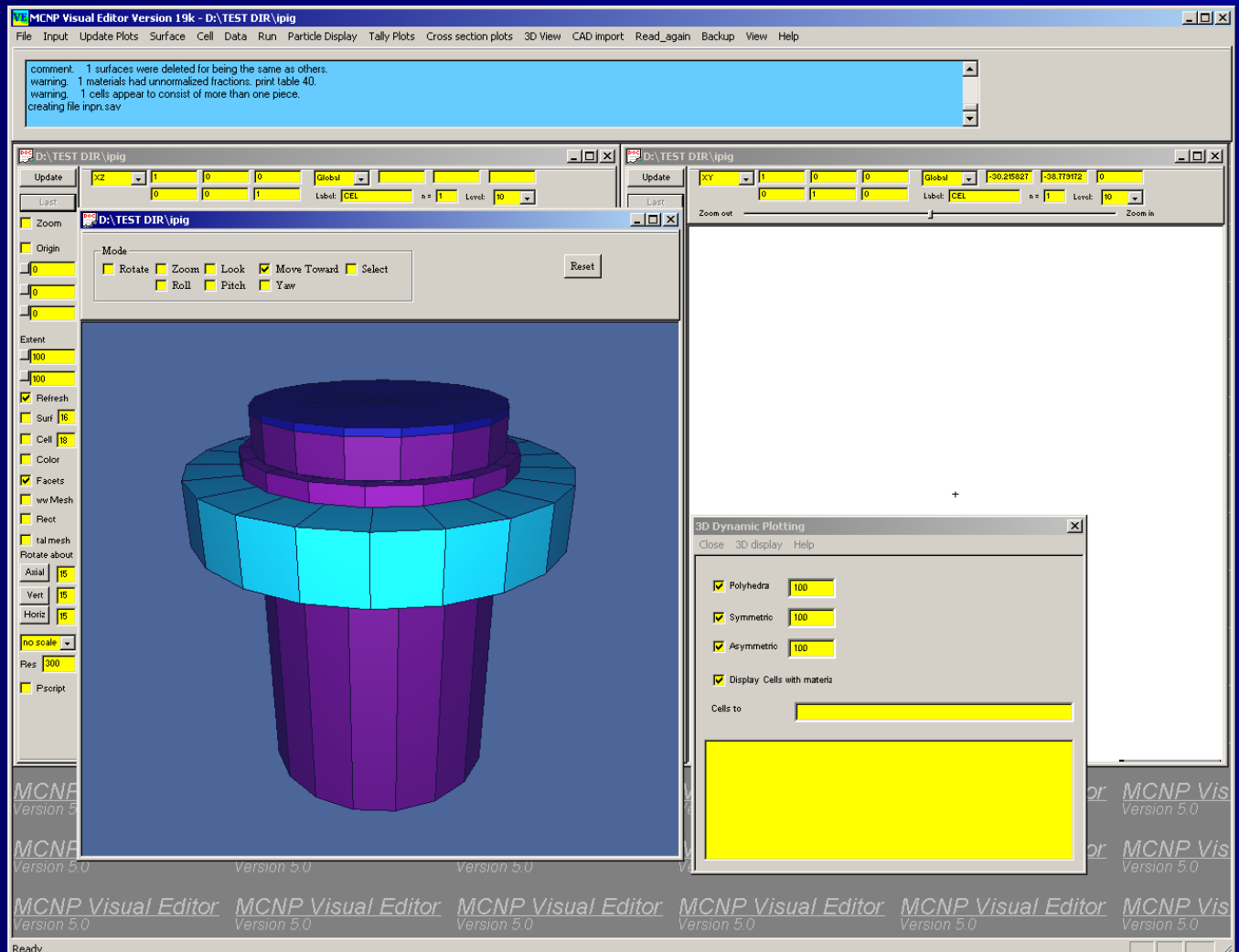
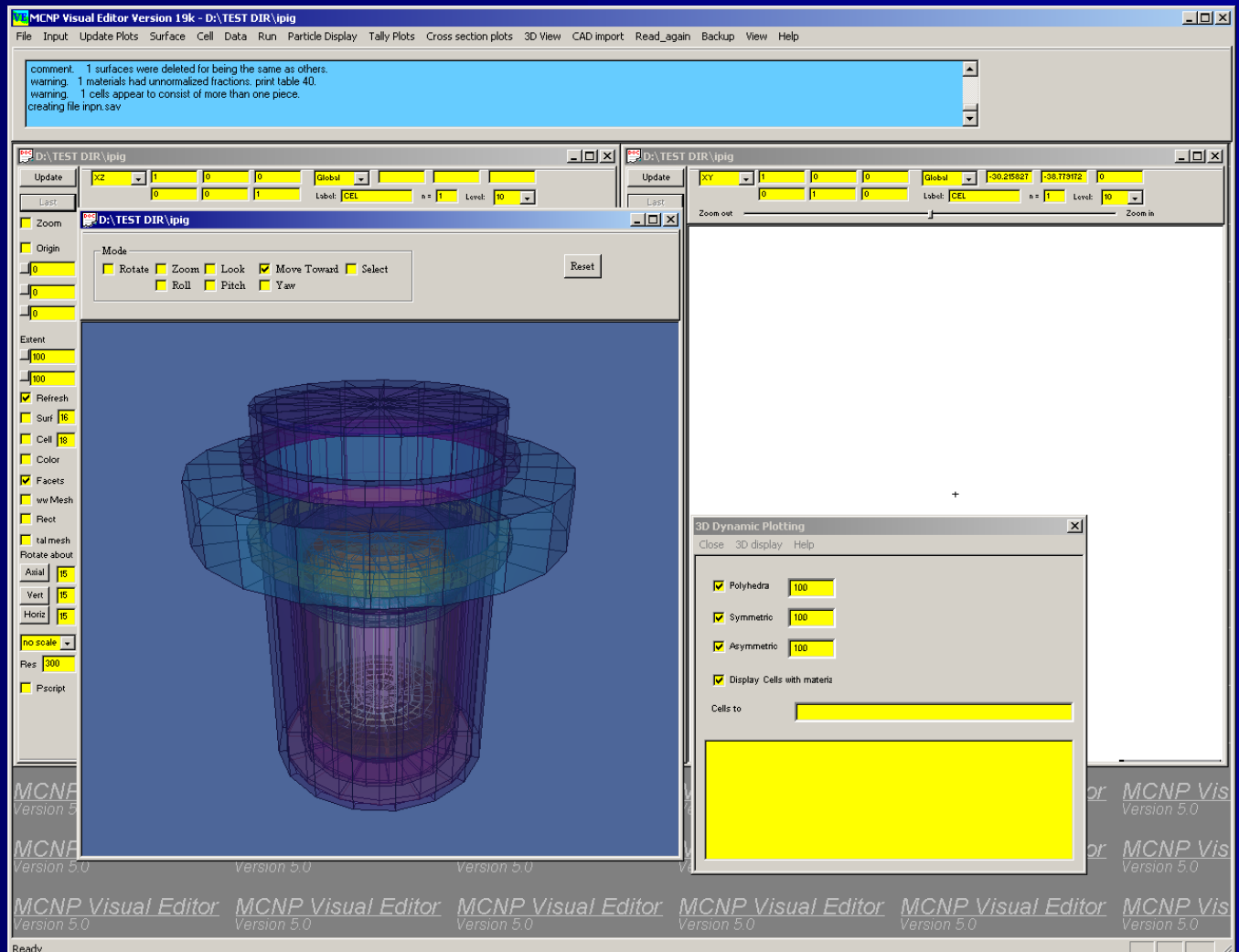
Dynamic 3D Display



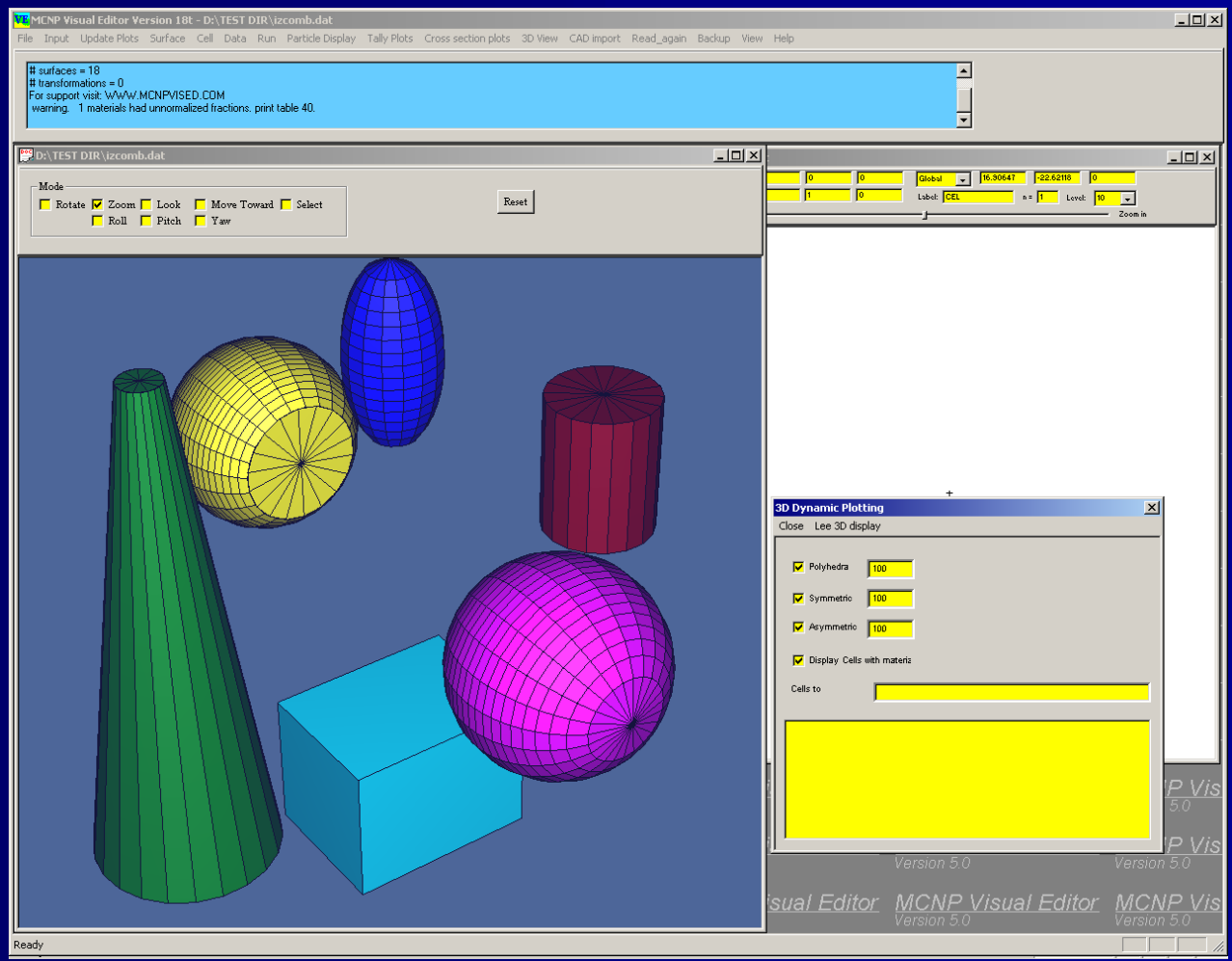
Visual Editor Capabilities

Dynamic 3D Display



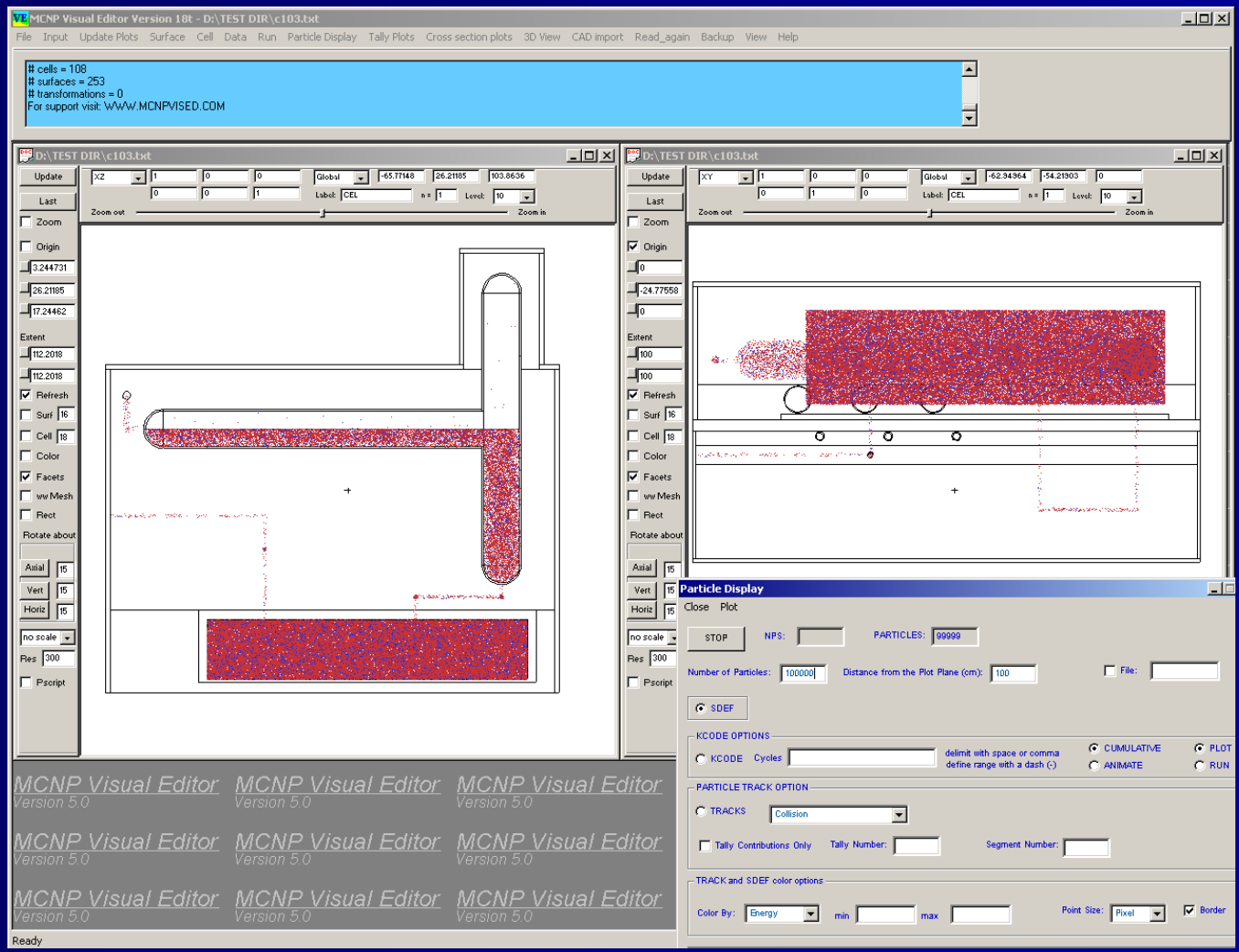
Visual Editor Capabilities

Dynamic 3D Display



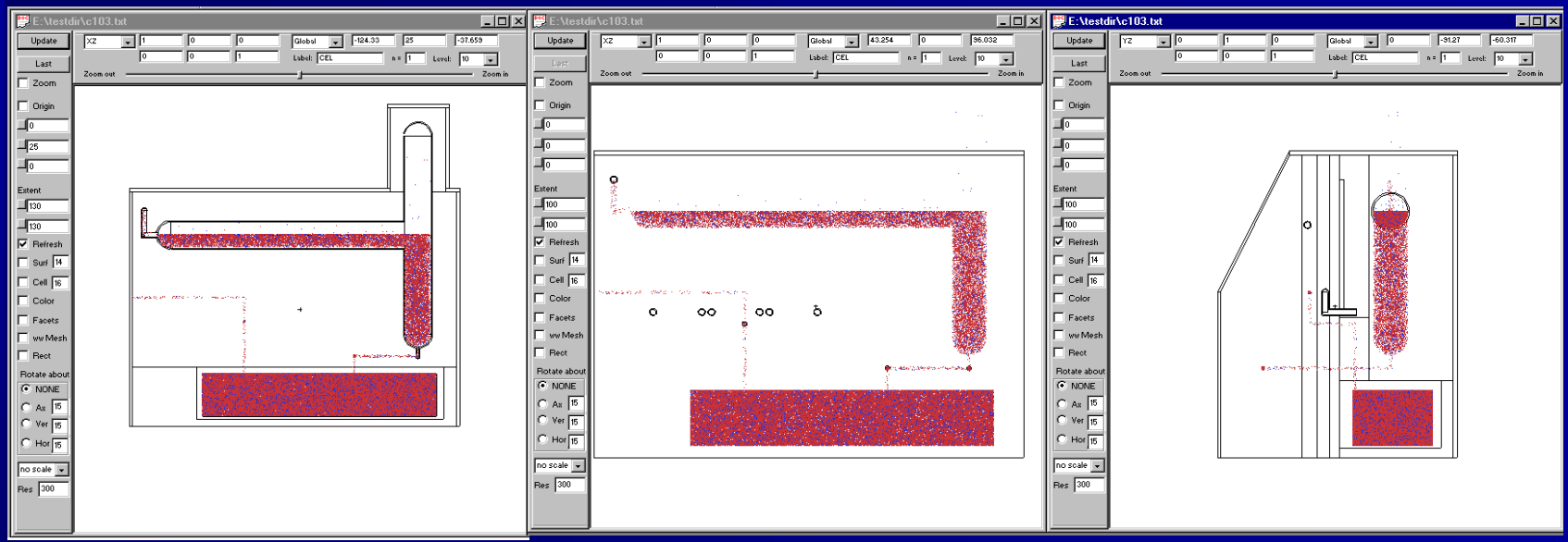
Visual Editor Capabilities

Source Point Plots



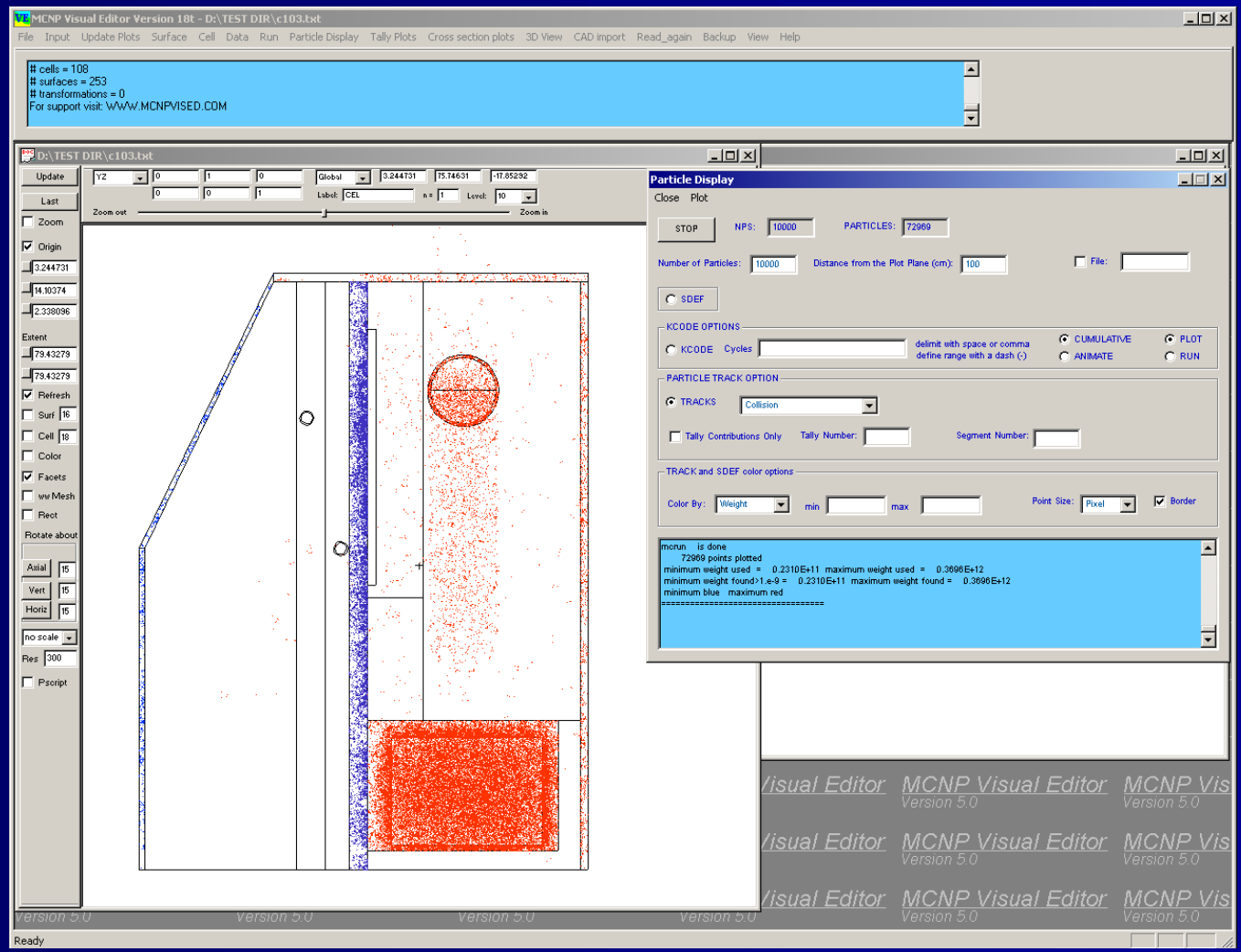
Visual Editor Capabilities

Source Point Plots



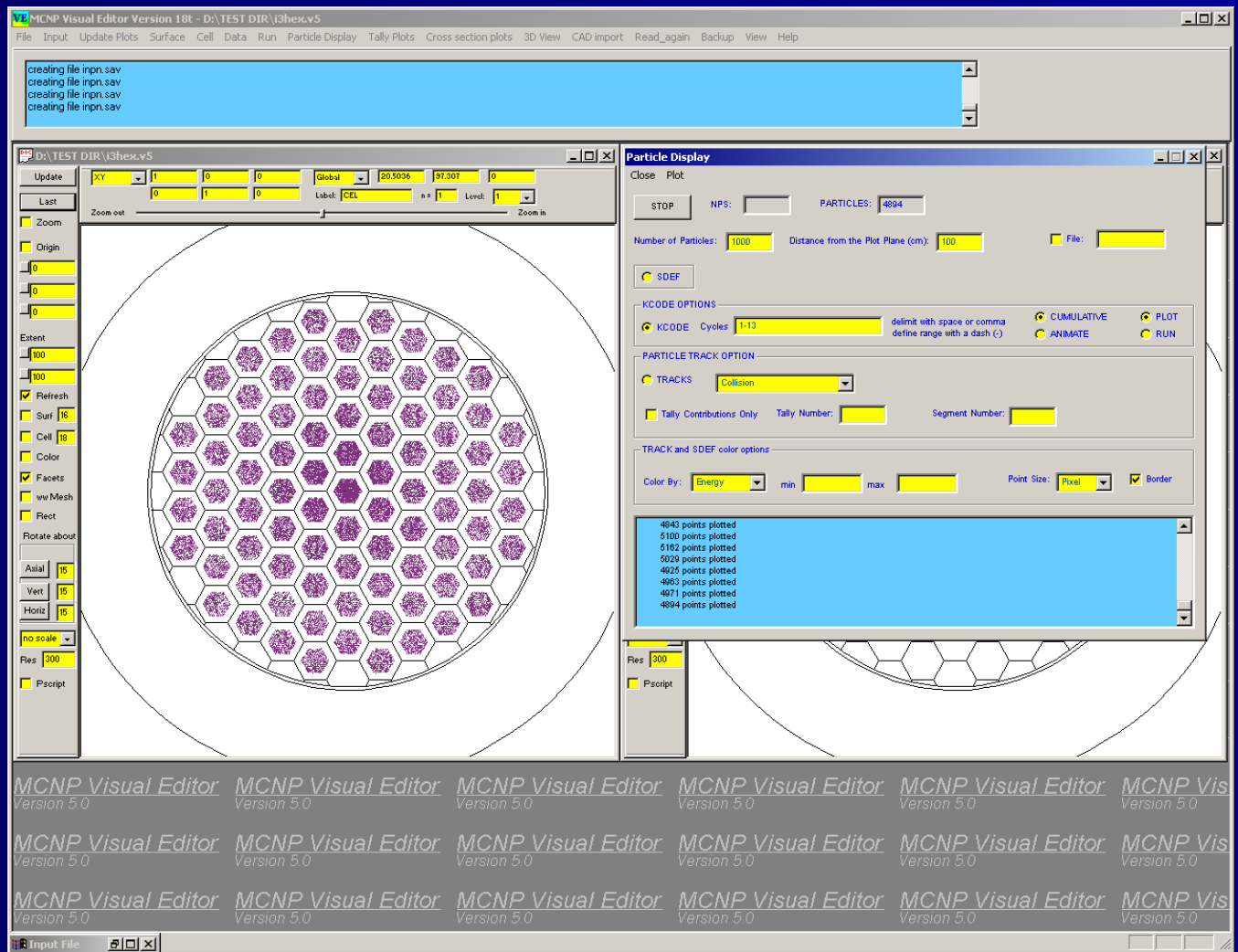
Visual Editor Capabilities

Collision Plots (color by weight)

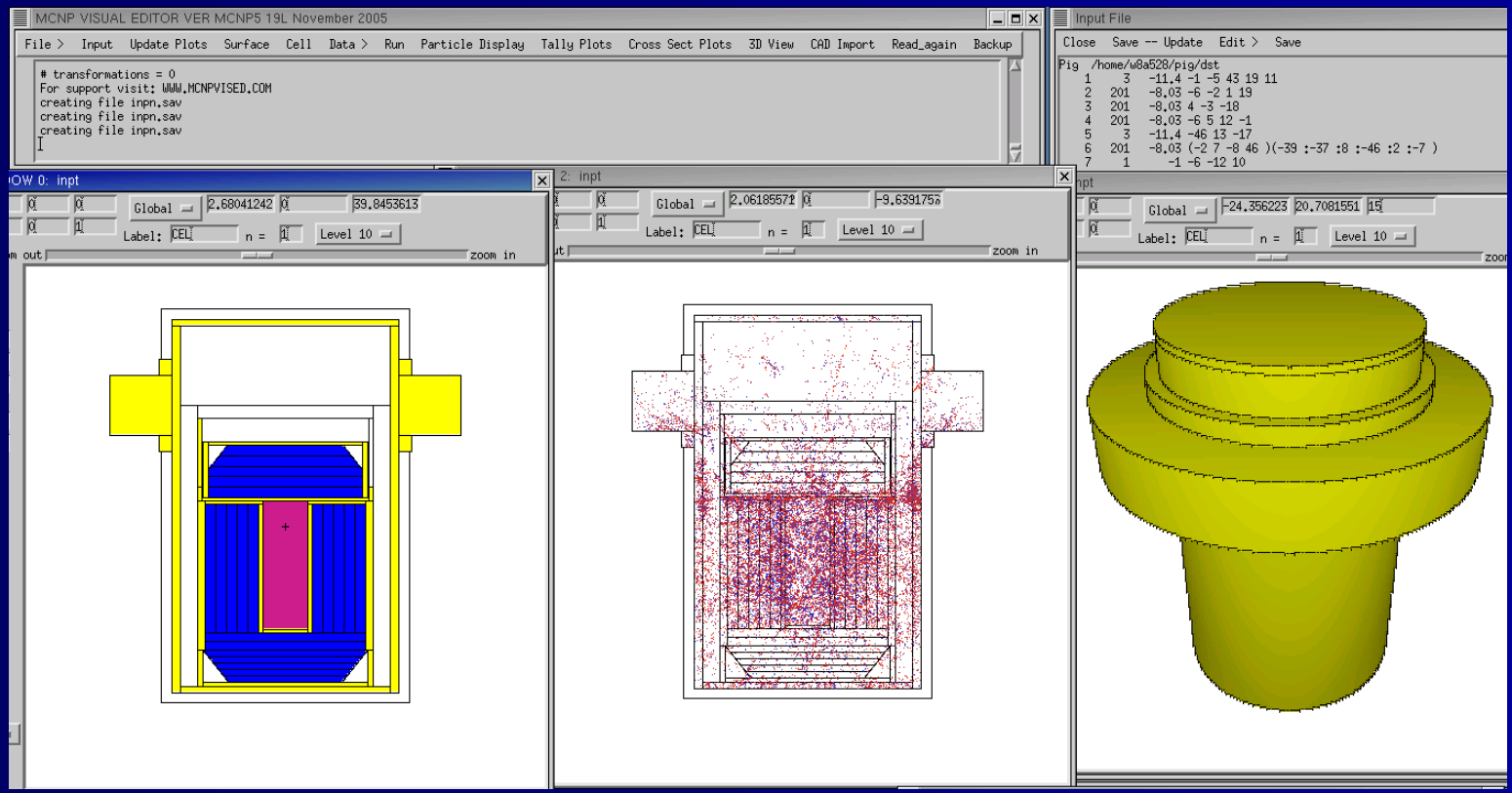


Visual Editor Capabilities

KCODE Source Generation Points

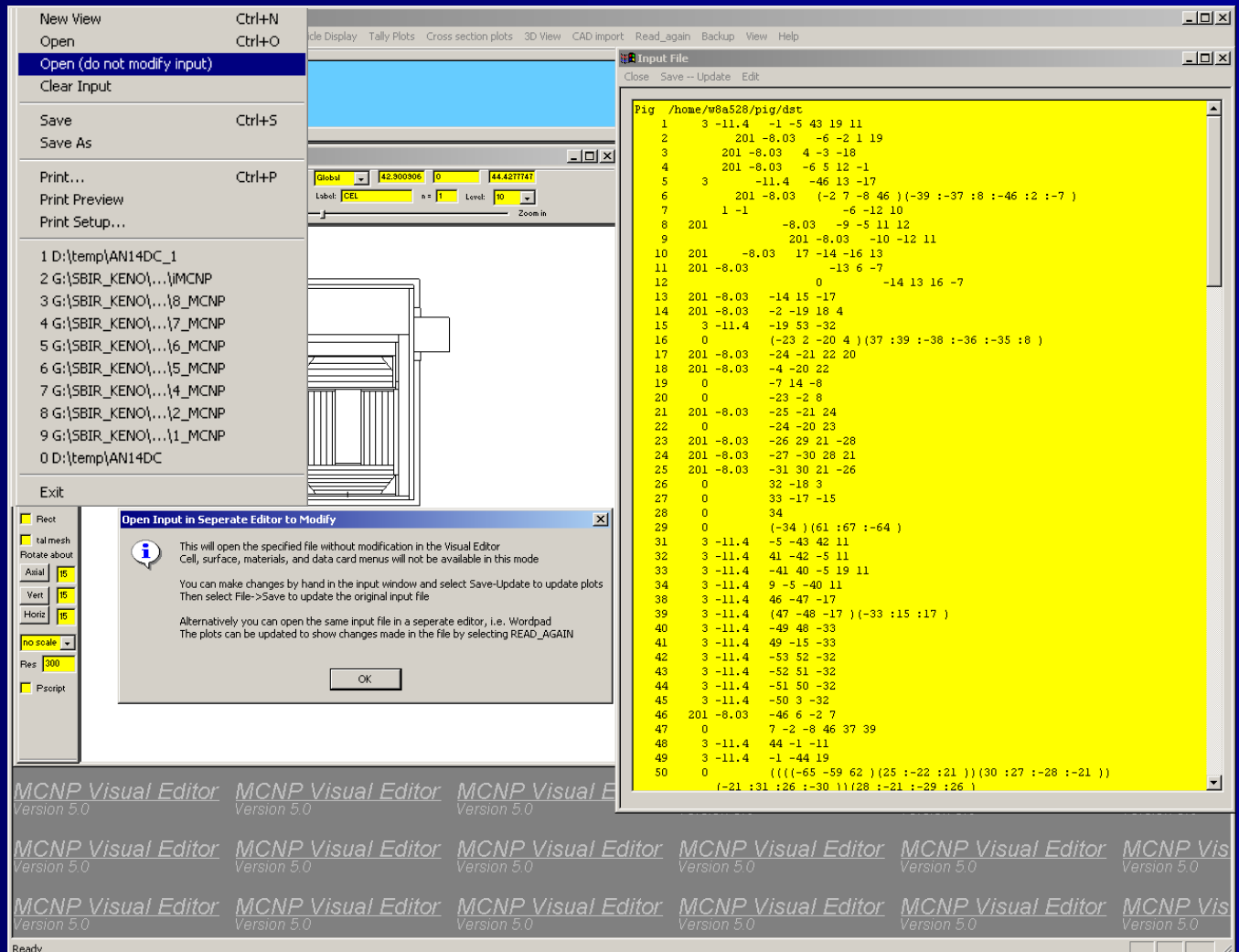


New Feature
Linux Version

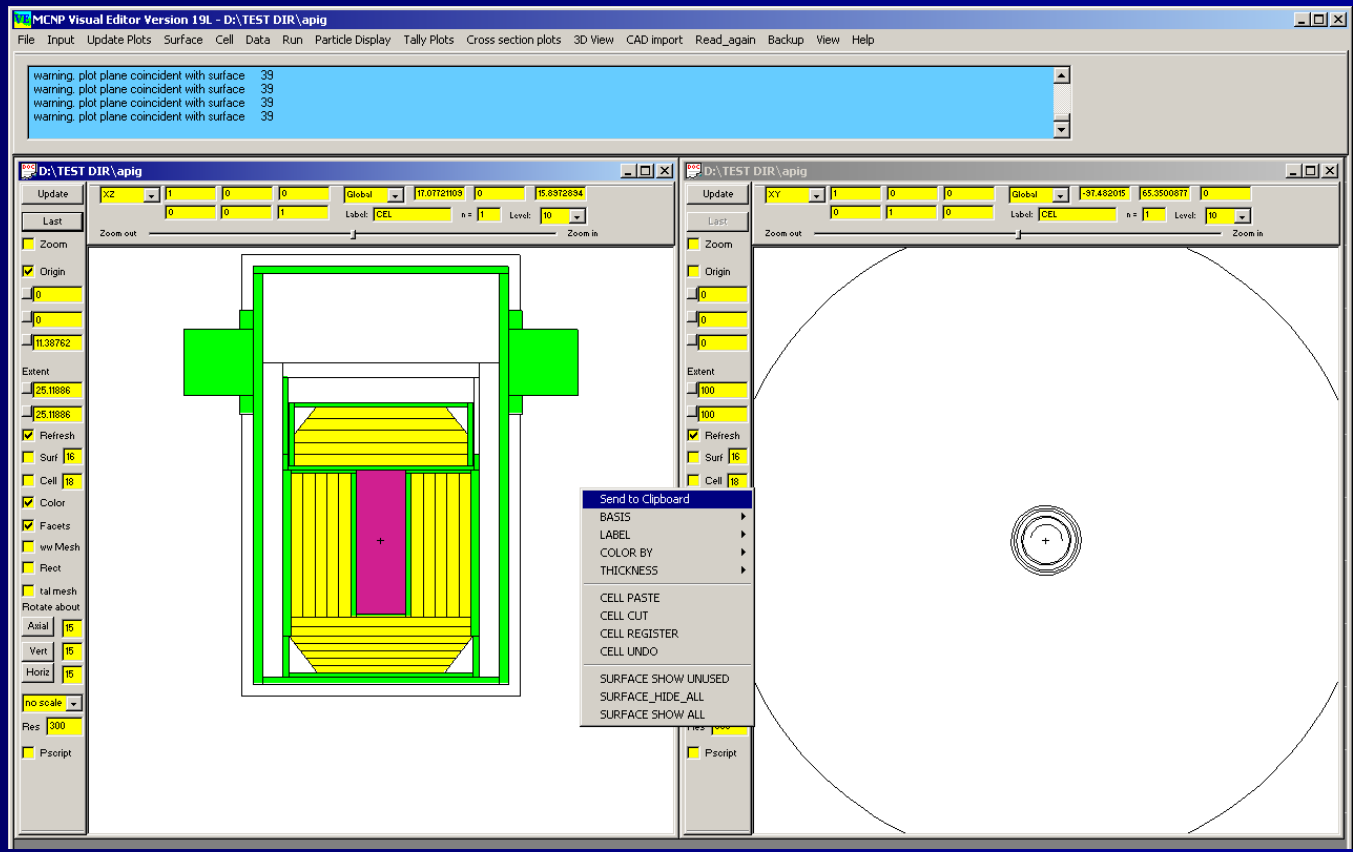


New Feature

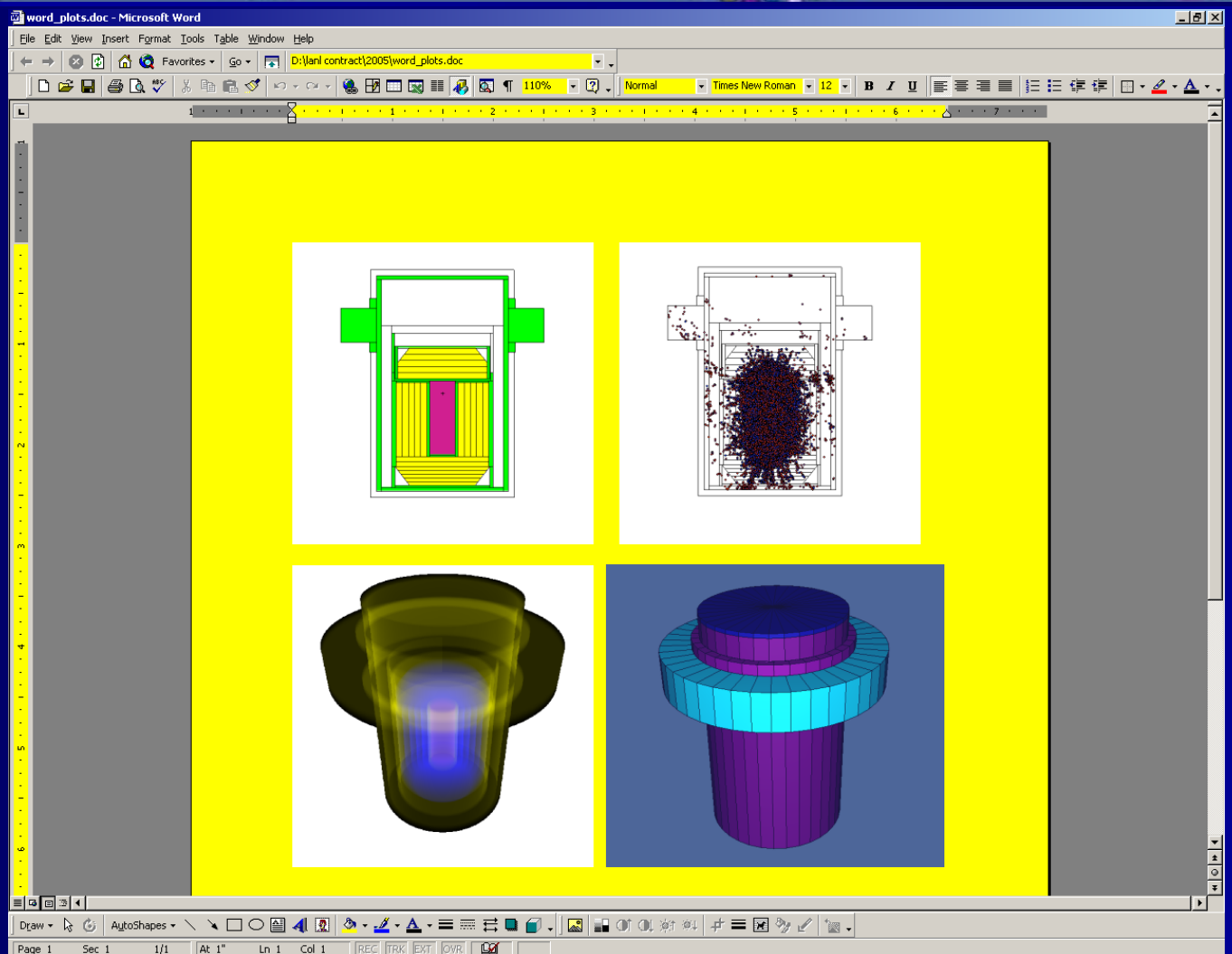
Open (Do Not Modify)



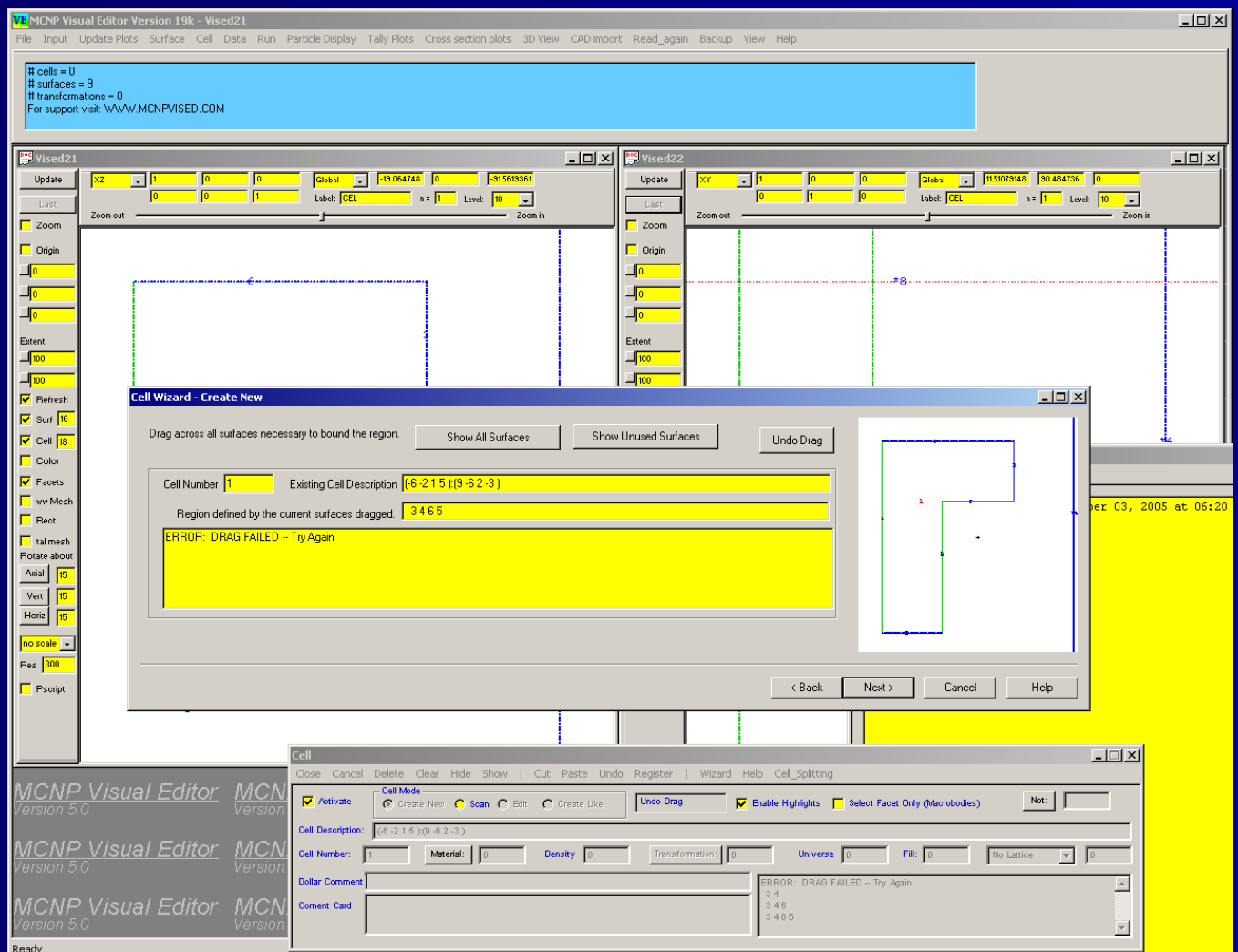
New Feature
Send to Clipboard



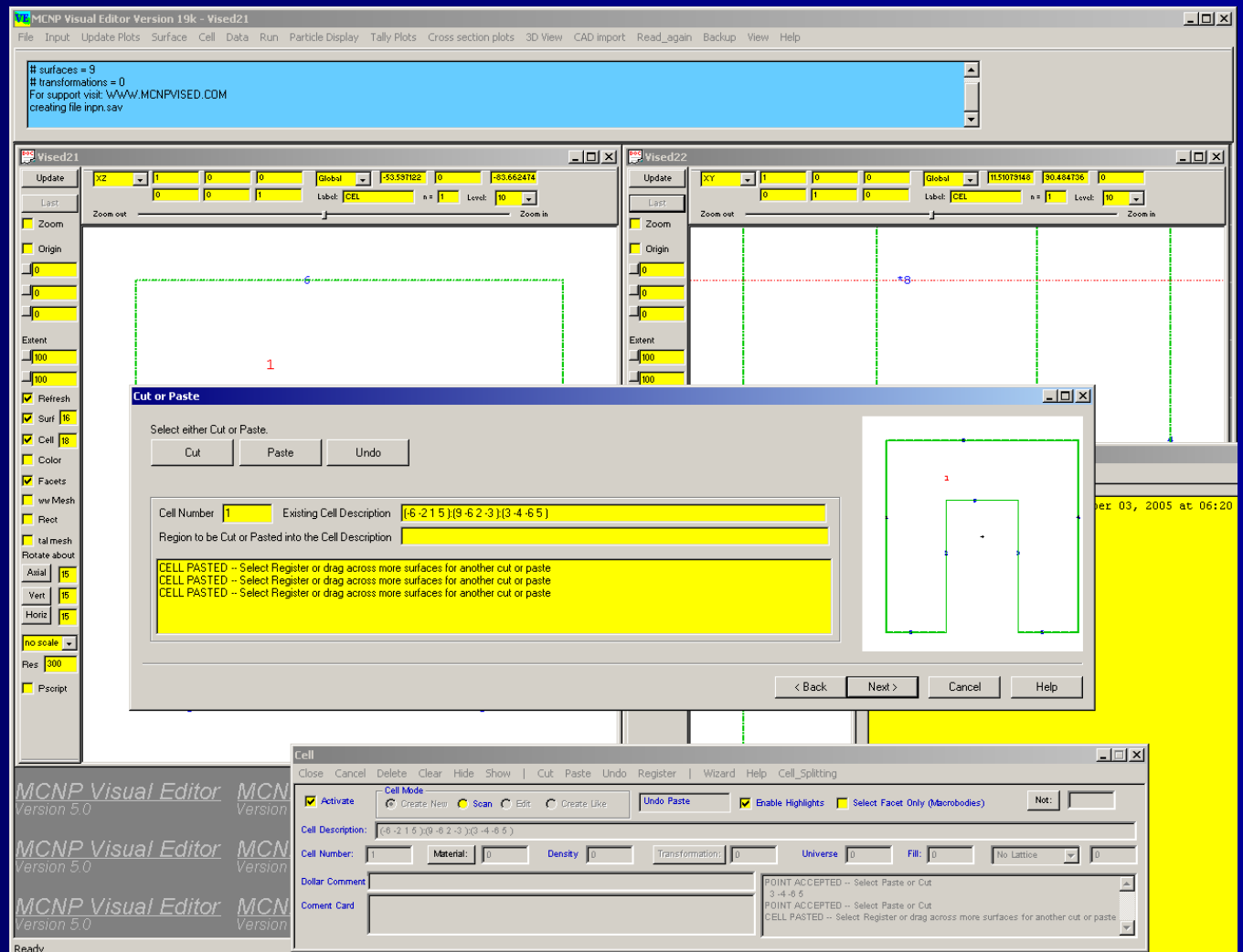
New Feature
Send to Clipboard



New Feature
Cell Wizard

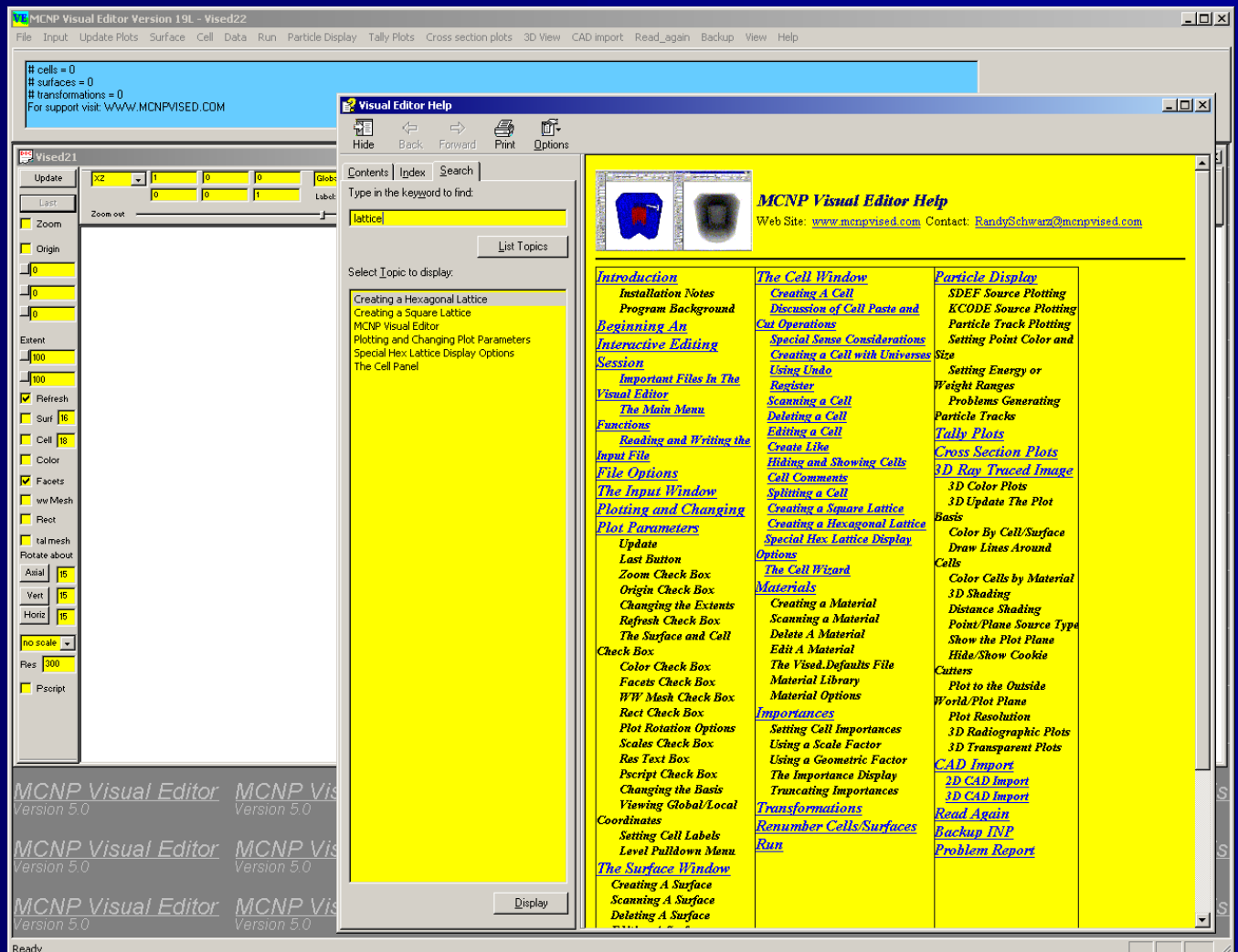


New Feature
Cell Wizard



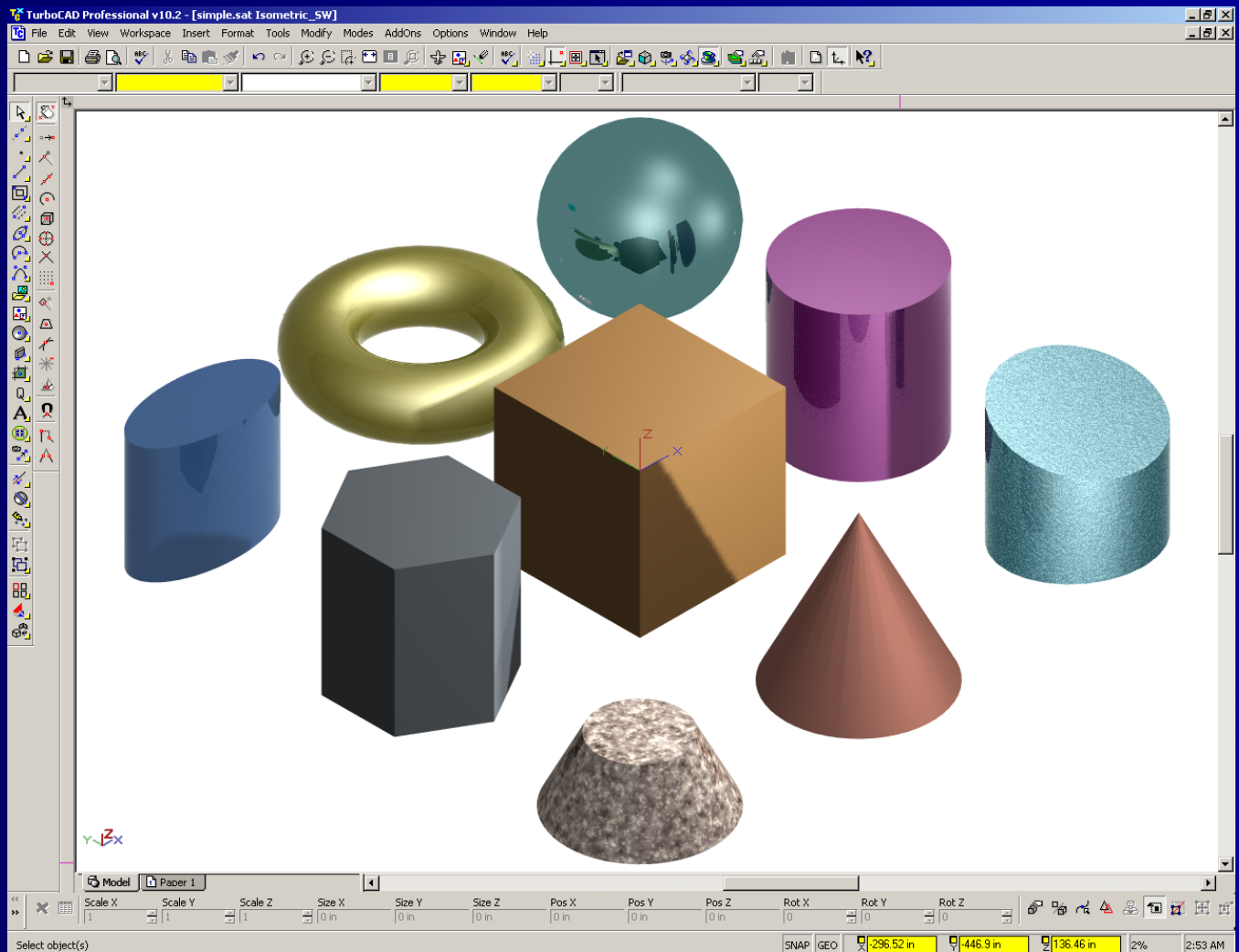
New Feature

Online Help



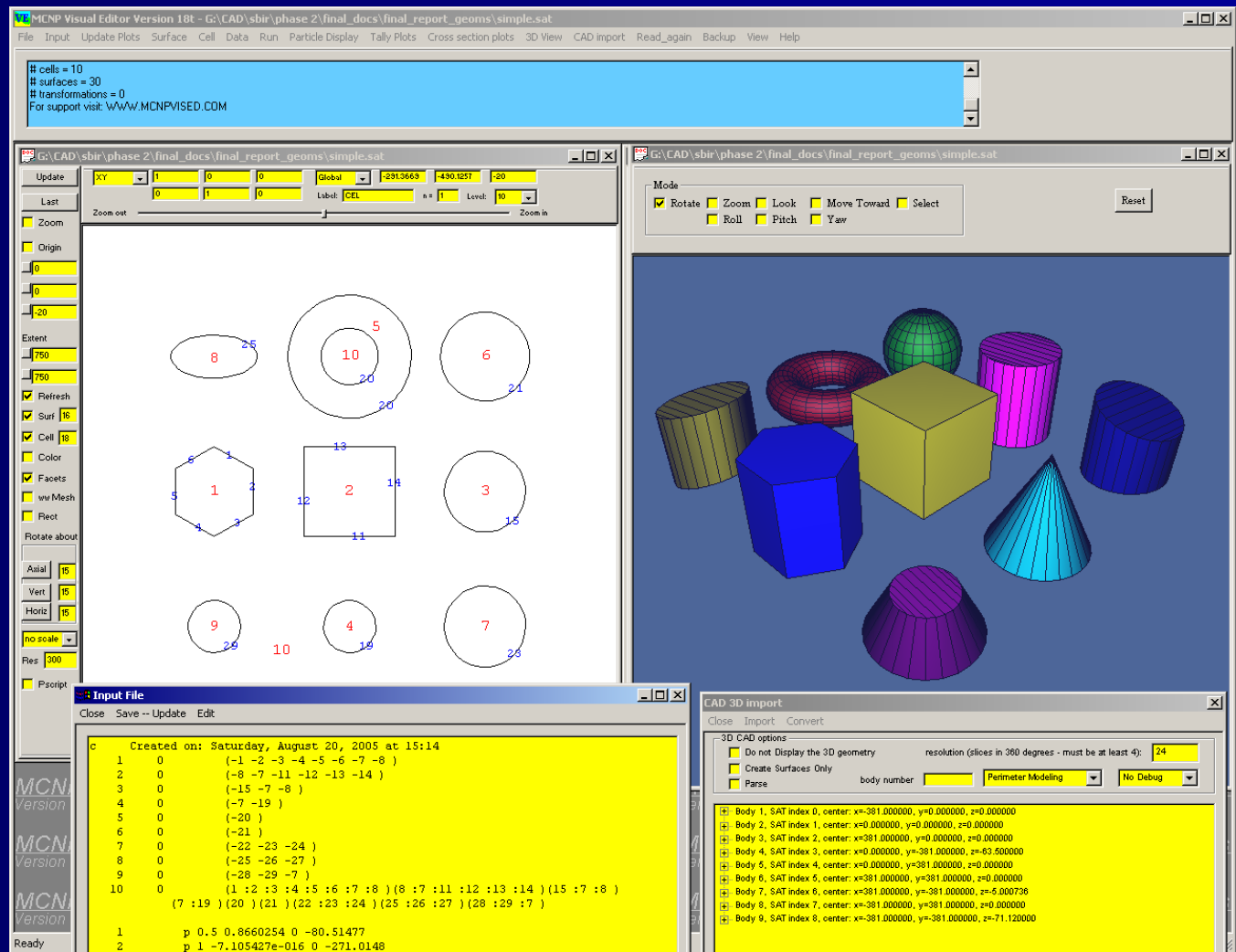
3D CAD conversion

Sample Geometries in CAD



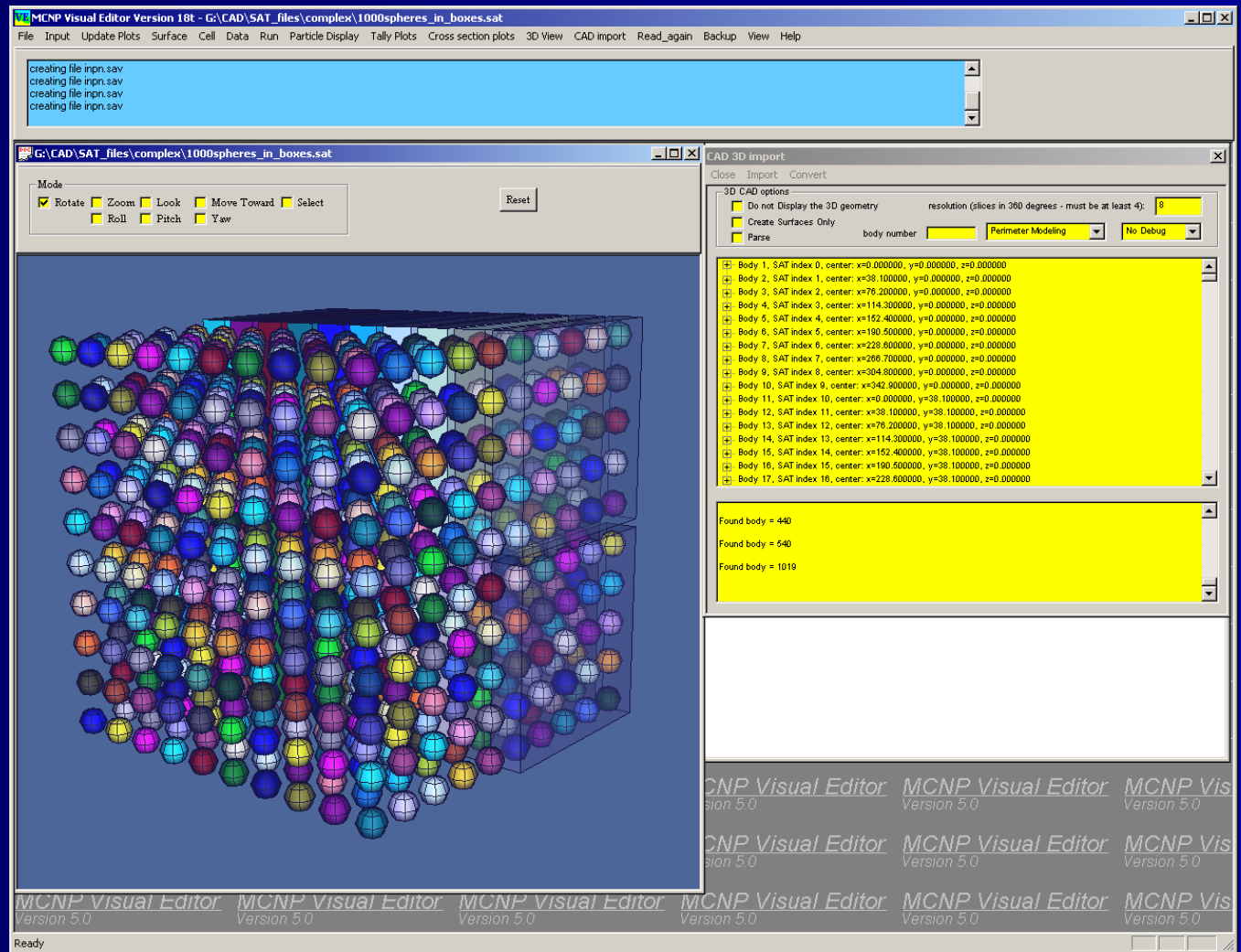
3D CAD conversion

Sample Geometries in MCNP



3D CAD conversion

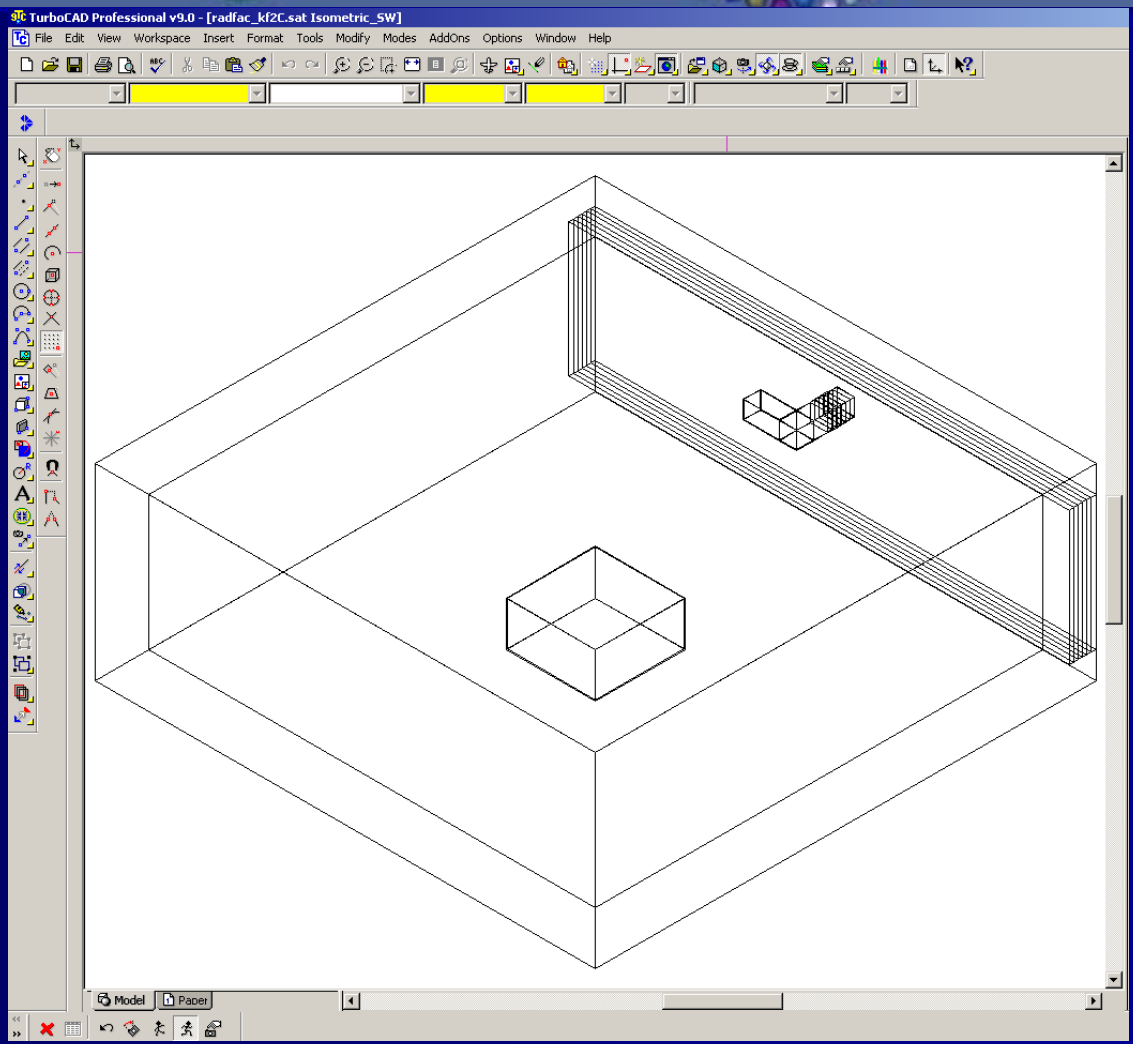
1,000 spheres



3D CAD conversion

Generate in CAD

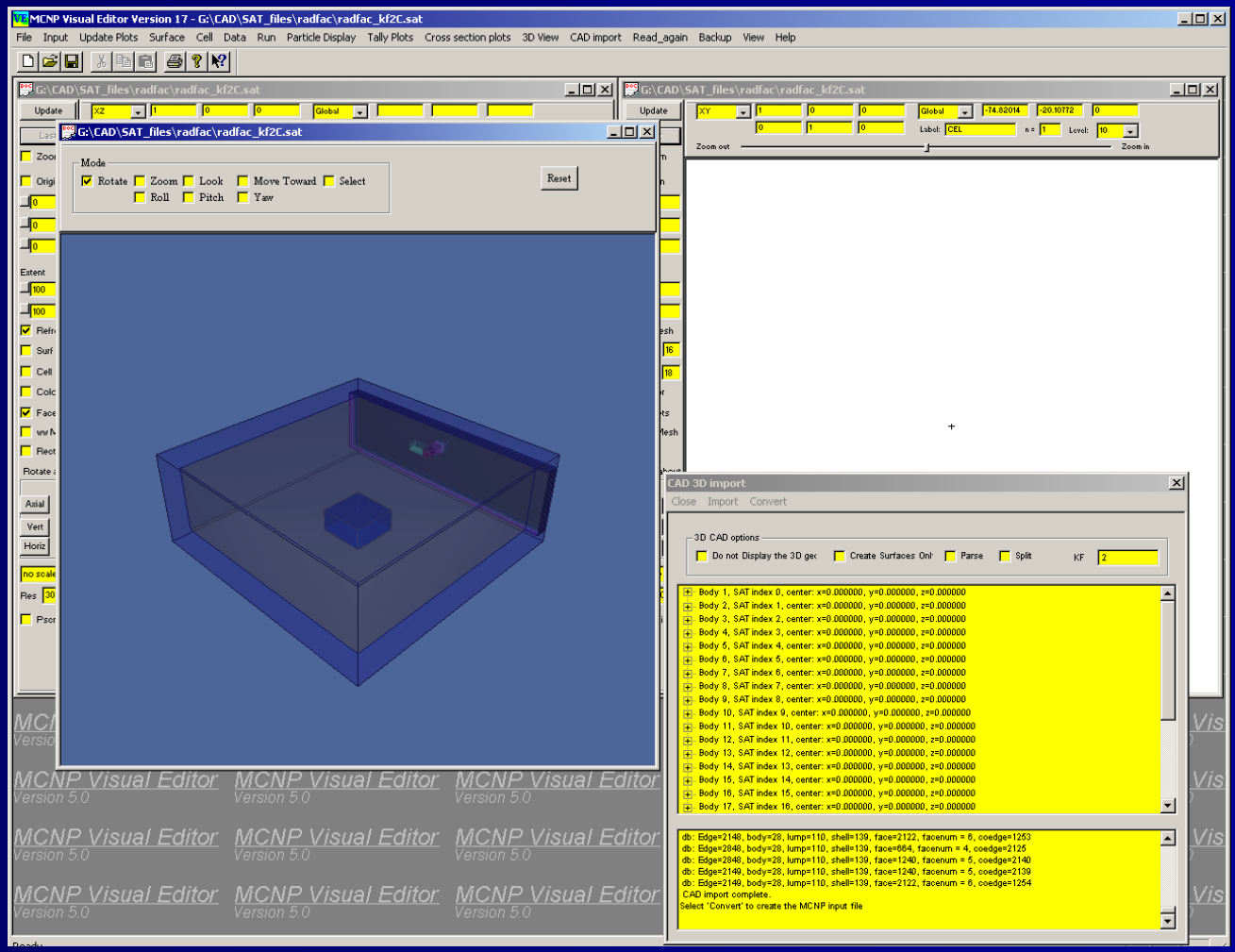
Export as a SAT file



3D CAD conversion

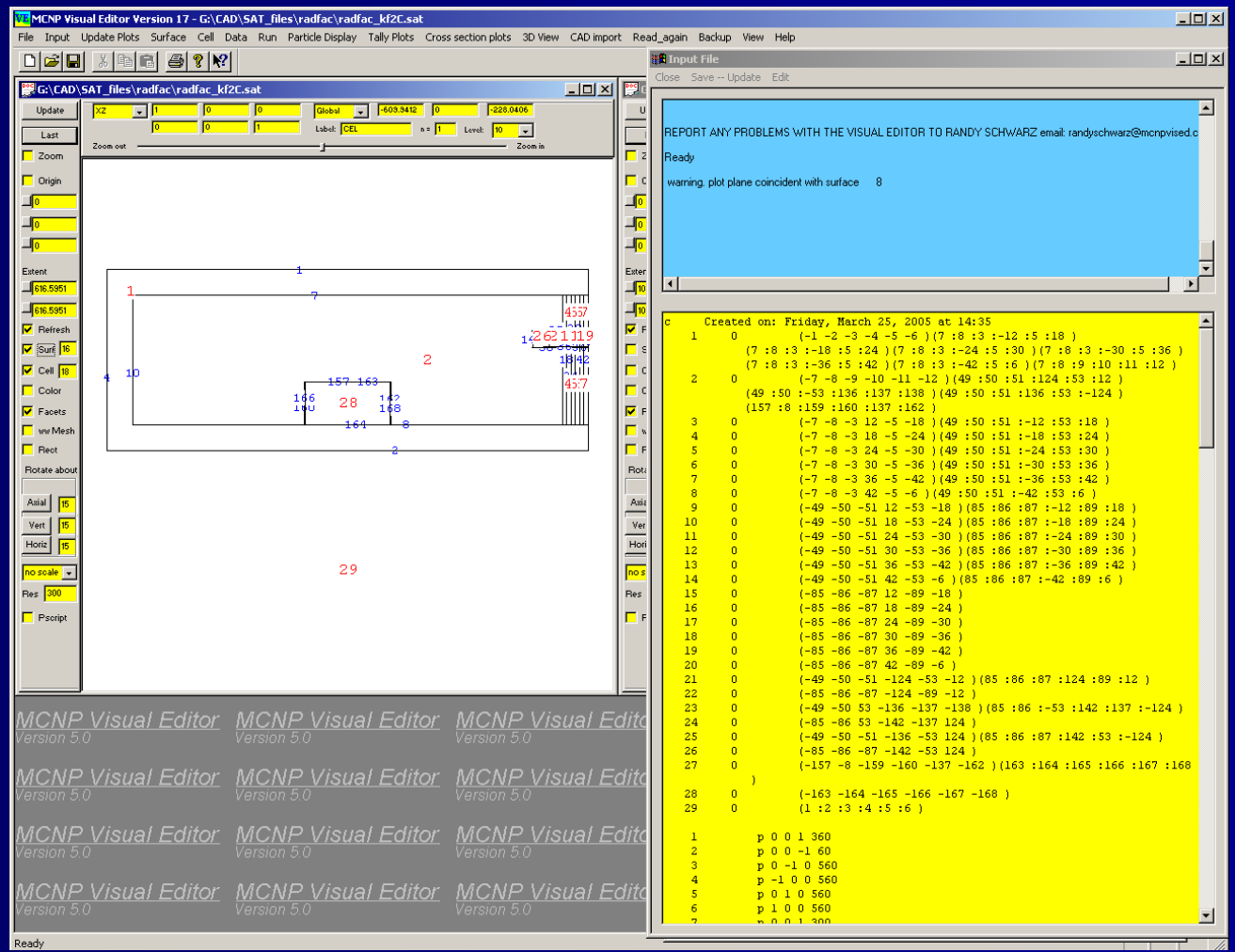
Read SAT File into Visual Editor

3D View of CAD Geometry Displayed



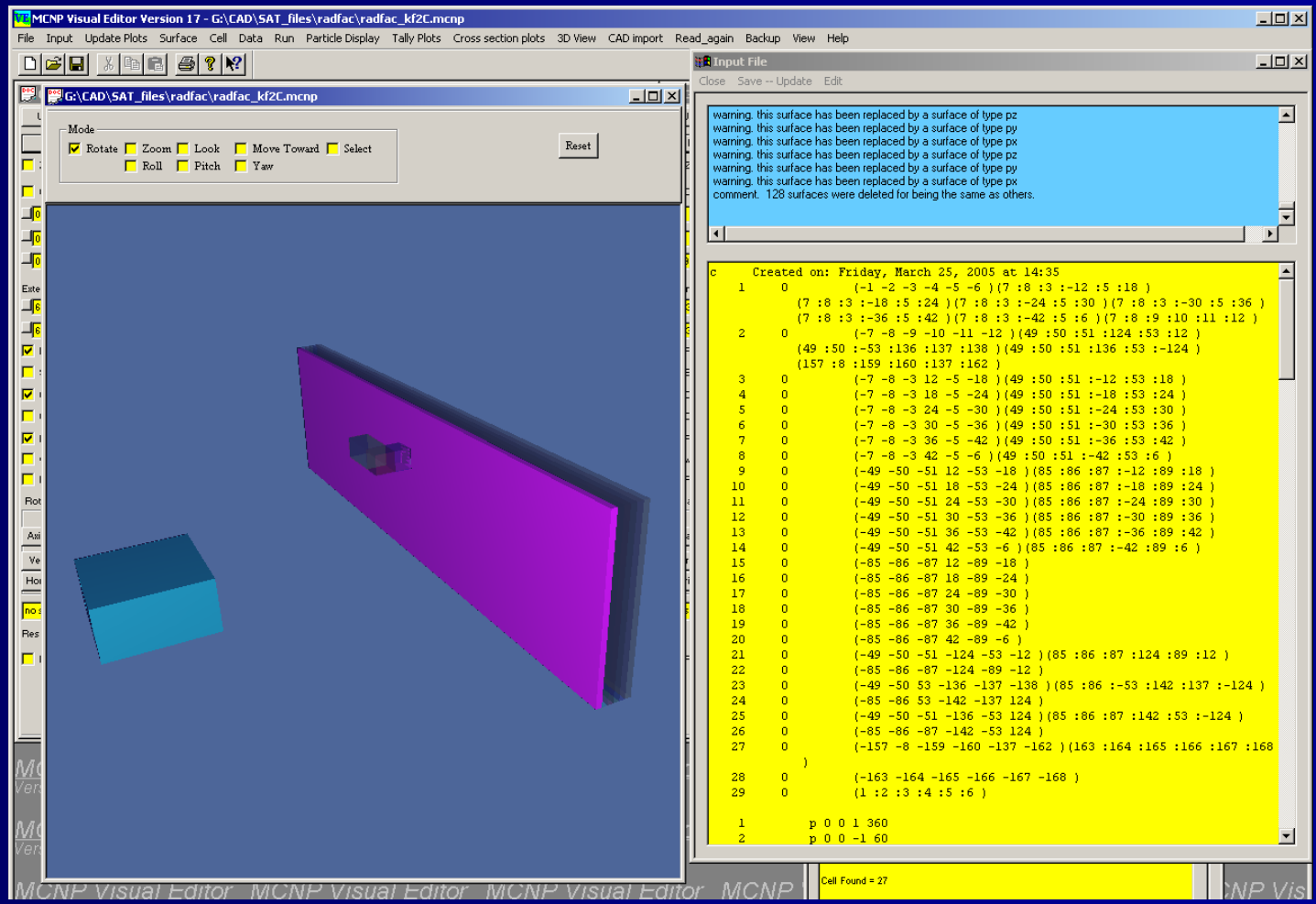
3D CAD conversion

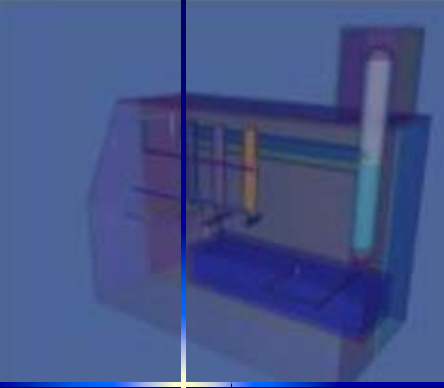
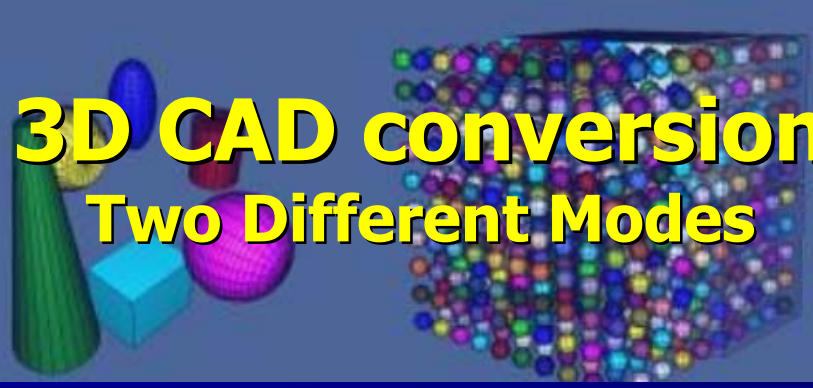
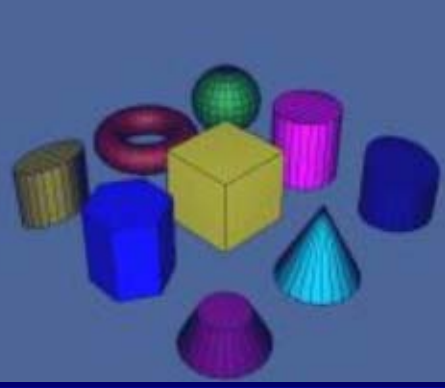
Convert to MCNP



3D CAD conversion

View MCNP Geometry in 3D



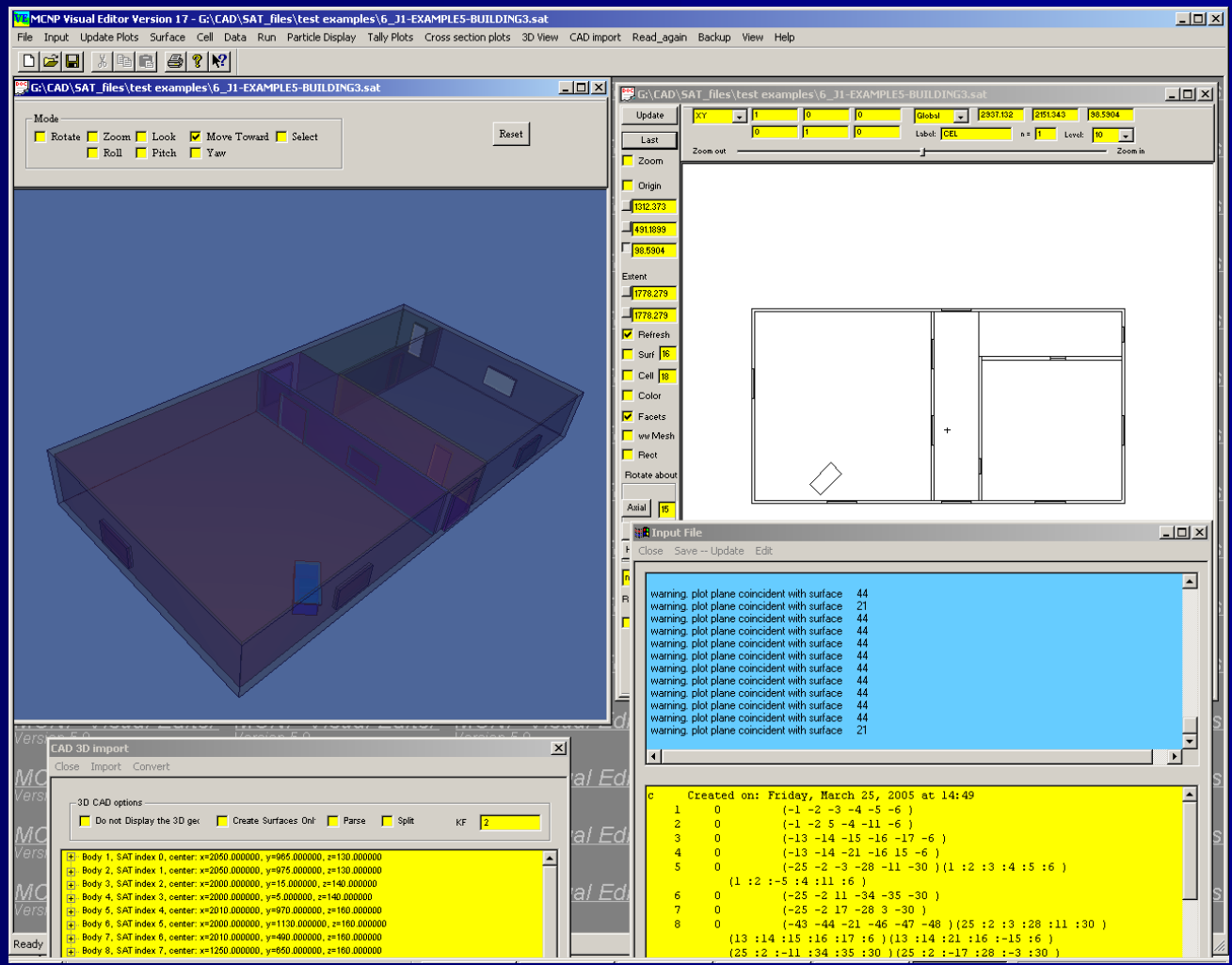




3D CAD conversion
Two Different Modes

- Use CAD to Create the MCNP geometry.
  - Define the geometry without using subtractions or unions
  - Conversion program will determine the subtractions and unions.
- Read an already existing fully defined geometry
  - All space must be defined
  - May need to simplify overly complex cells

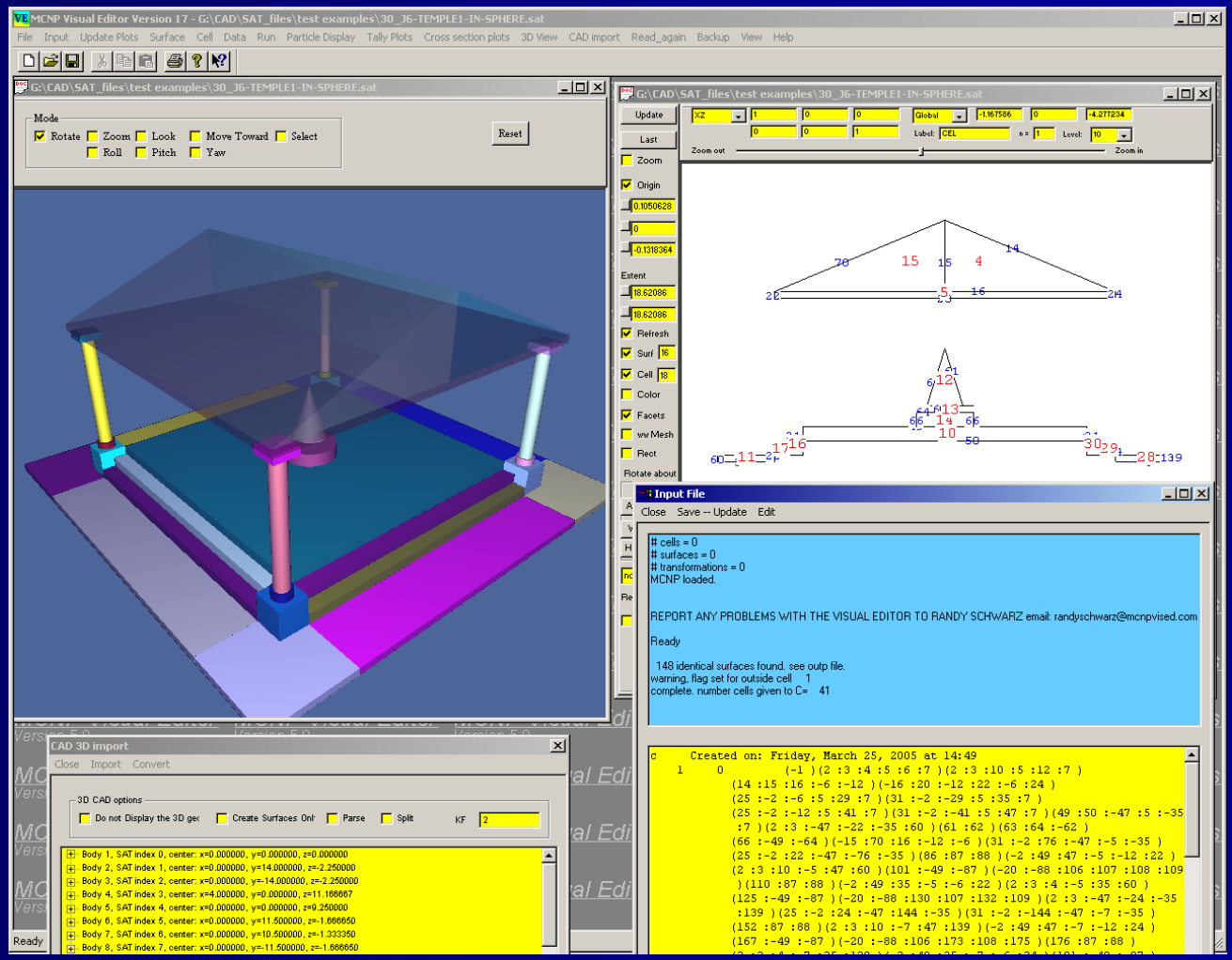
Example 3D CAD conversion

Building



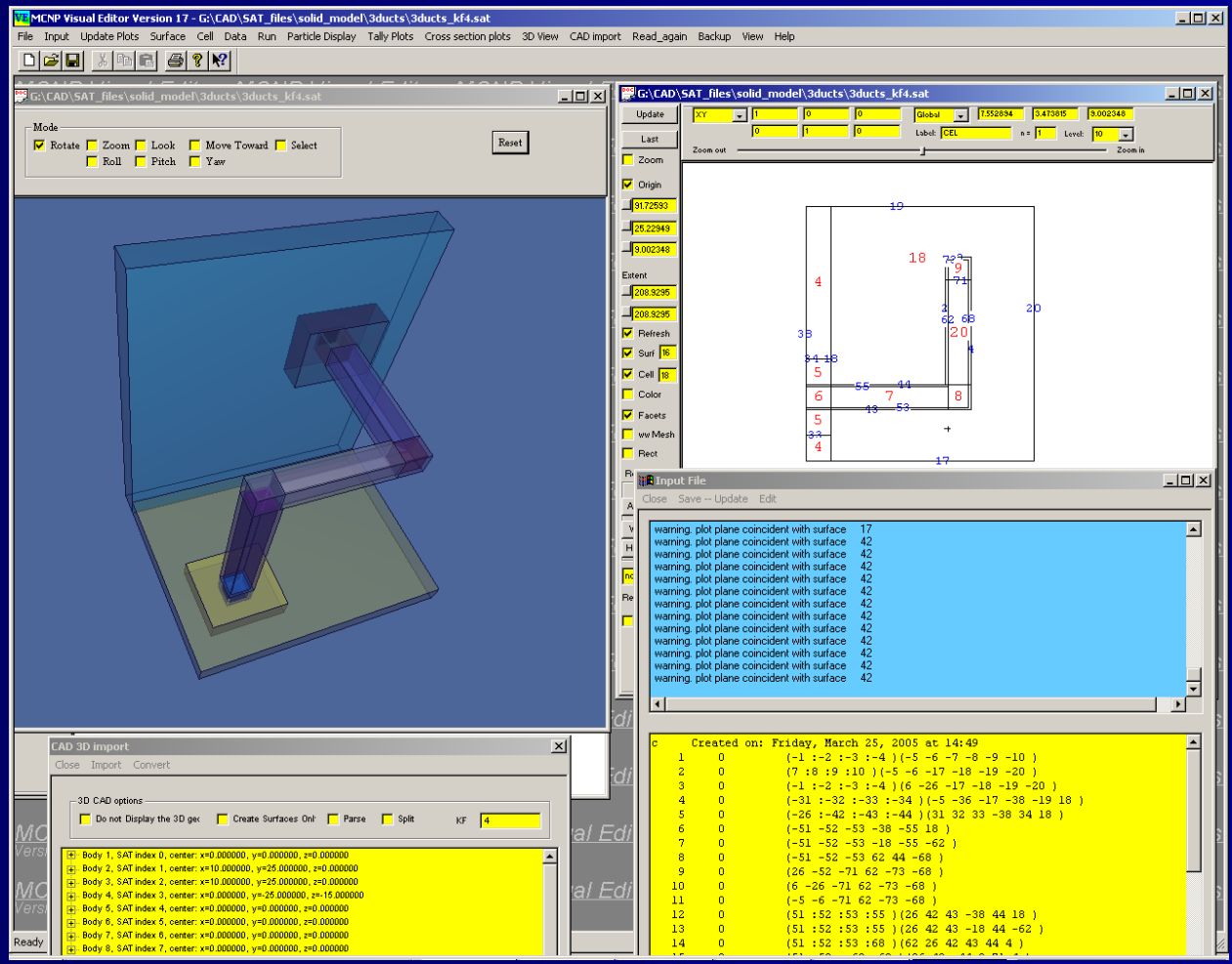
Example 3D CAD conversion

Building



Example 3D CAD conversion

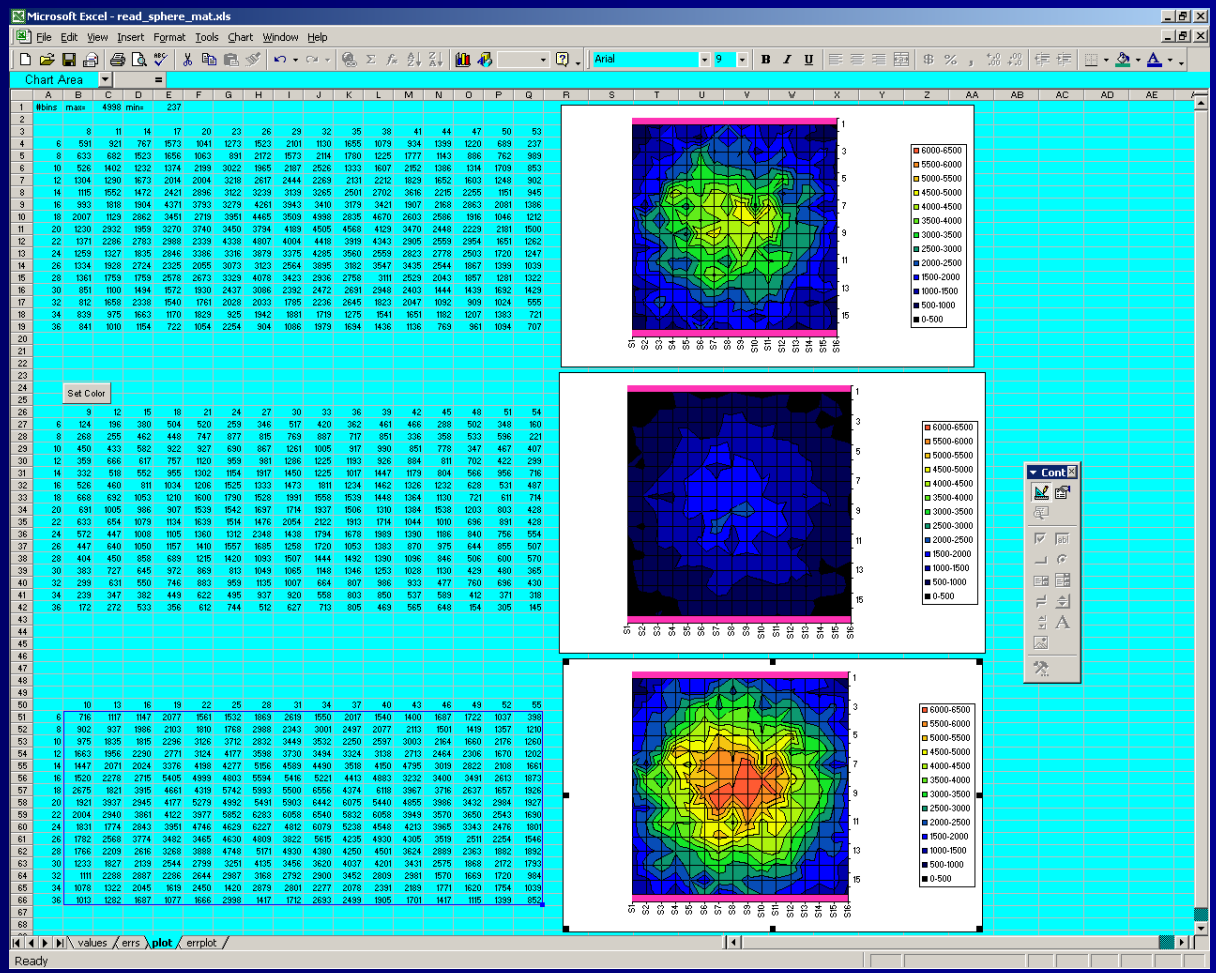
Duct with 3 Bends



Next MCNP Output Visualization Class

July 10th – 11th

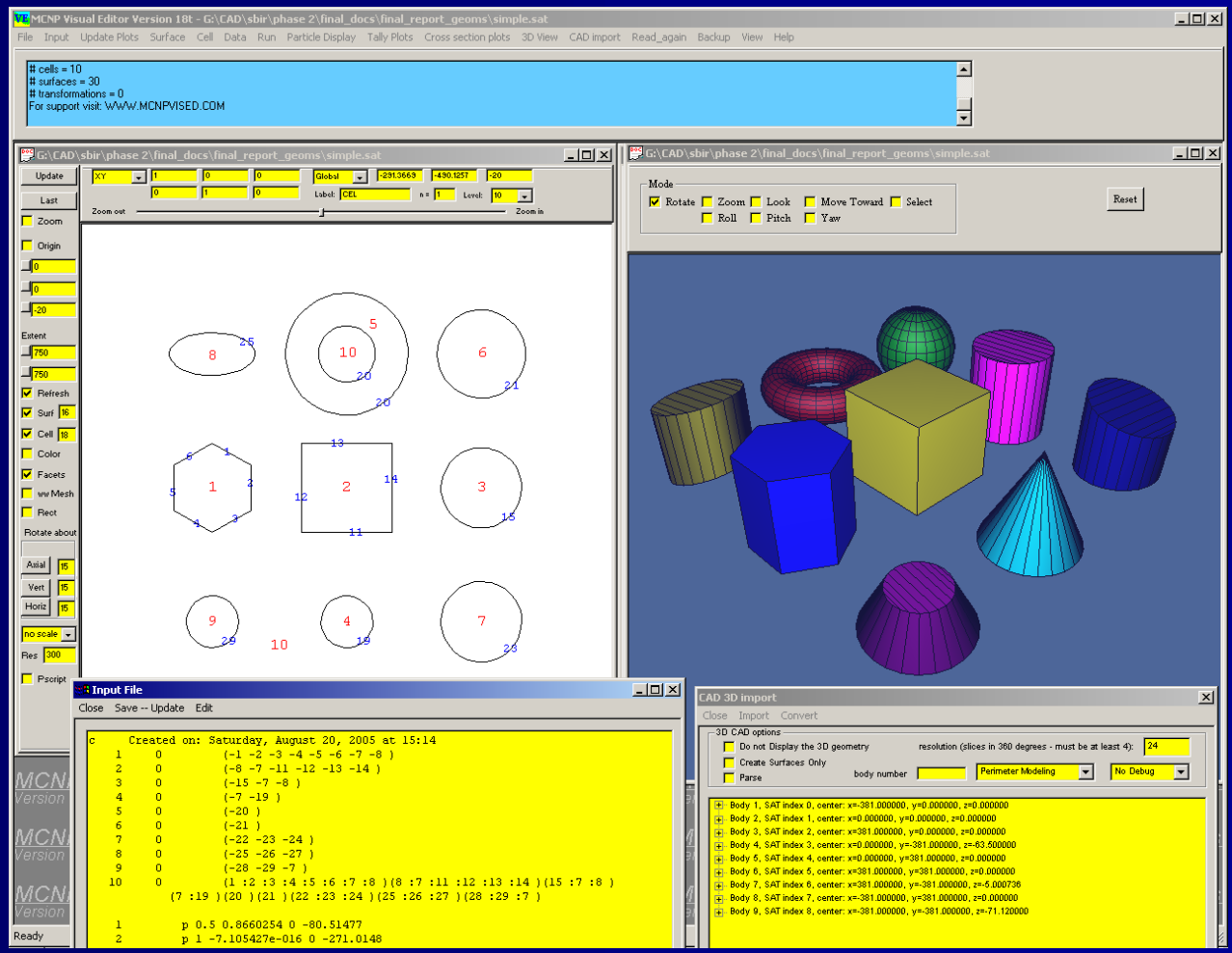
Richland, Washington



Next CAD to MCNP class

August 7th – 8th

Richland, Washington



Next MCNP Visual Editor Class

September 11th – 15th

Richland, Washington