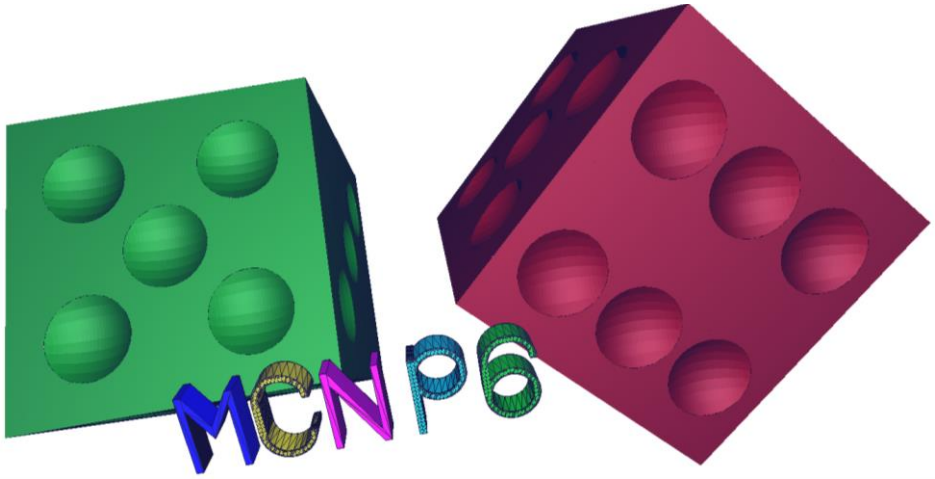
An MCNP6 Version of the Visual Editor

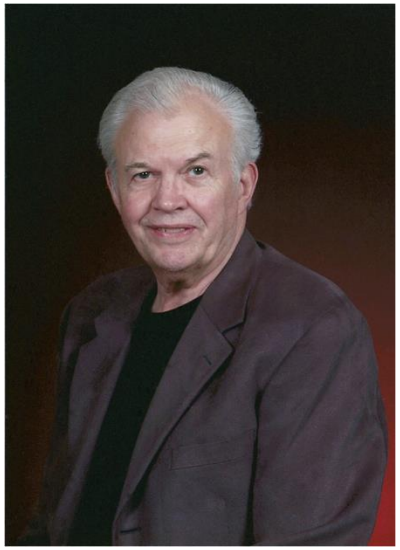
Presented at the
American Nuclear Society
Radiation Physics & Shielding Division meeting
Knoxville, Tennessee
September 14 – 18, 2014



Randy Schwarz
Visual Editor Consultants
www.mcnpvised.com

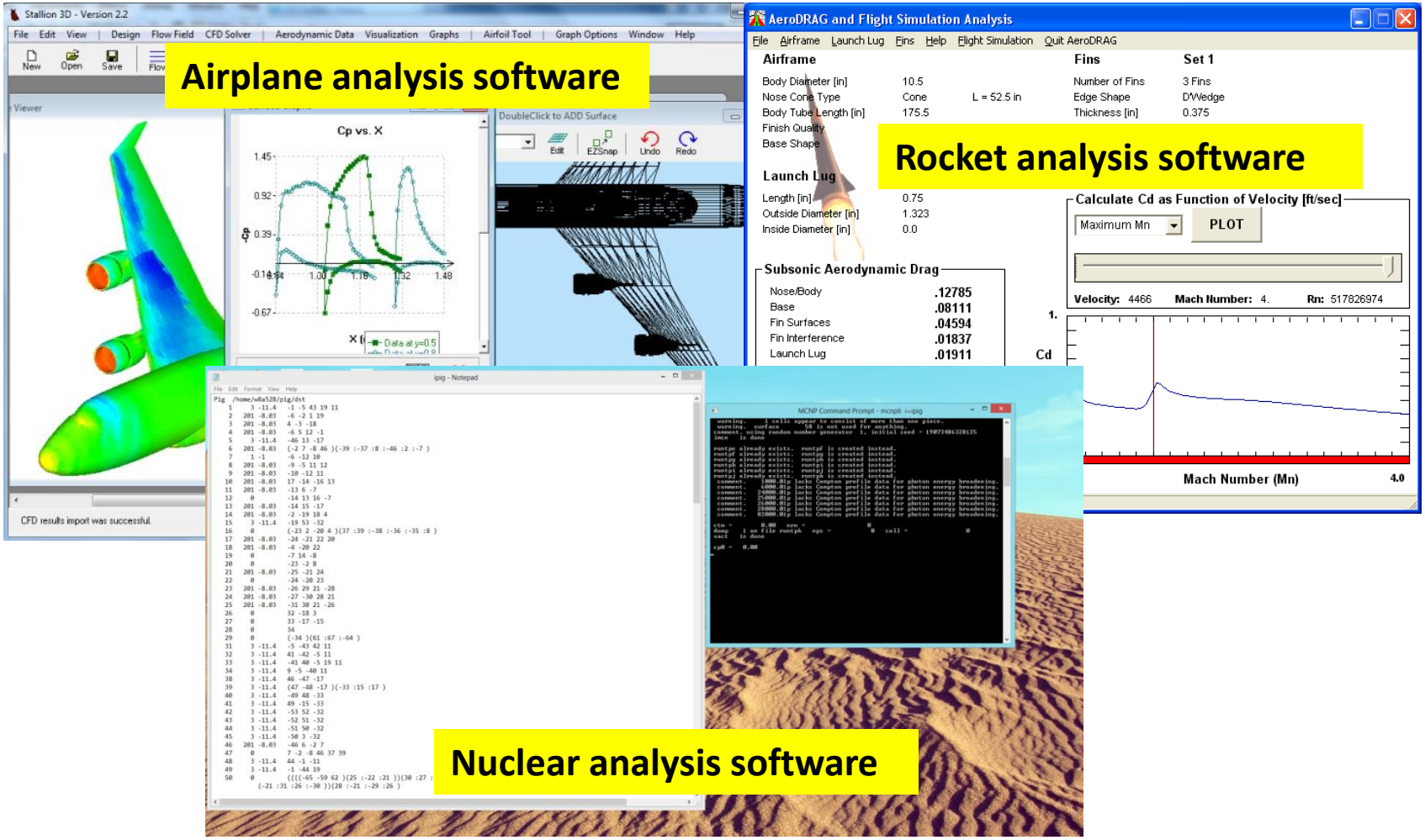
History of the Visual Editor

1. **Initially developed at Westinghouse Hanford Company in the early 1990s.**
2. **Development led by Dr. Lee Carter.**
3. **1993: Initial paper published**
4. **1997: Initial release to RSICC**
5. **1999: First workshop offered**
6. **2002: Windows version created**
7. **2008: MCNPX version created**
8. **2014: MCNP6 version created**

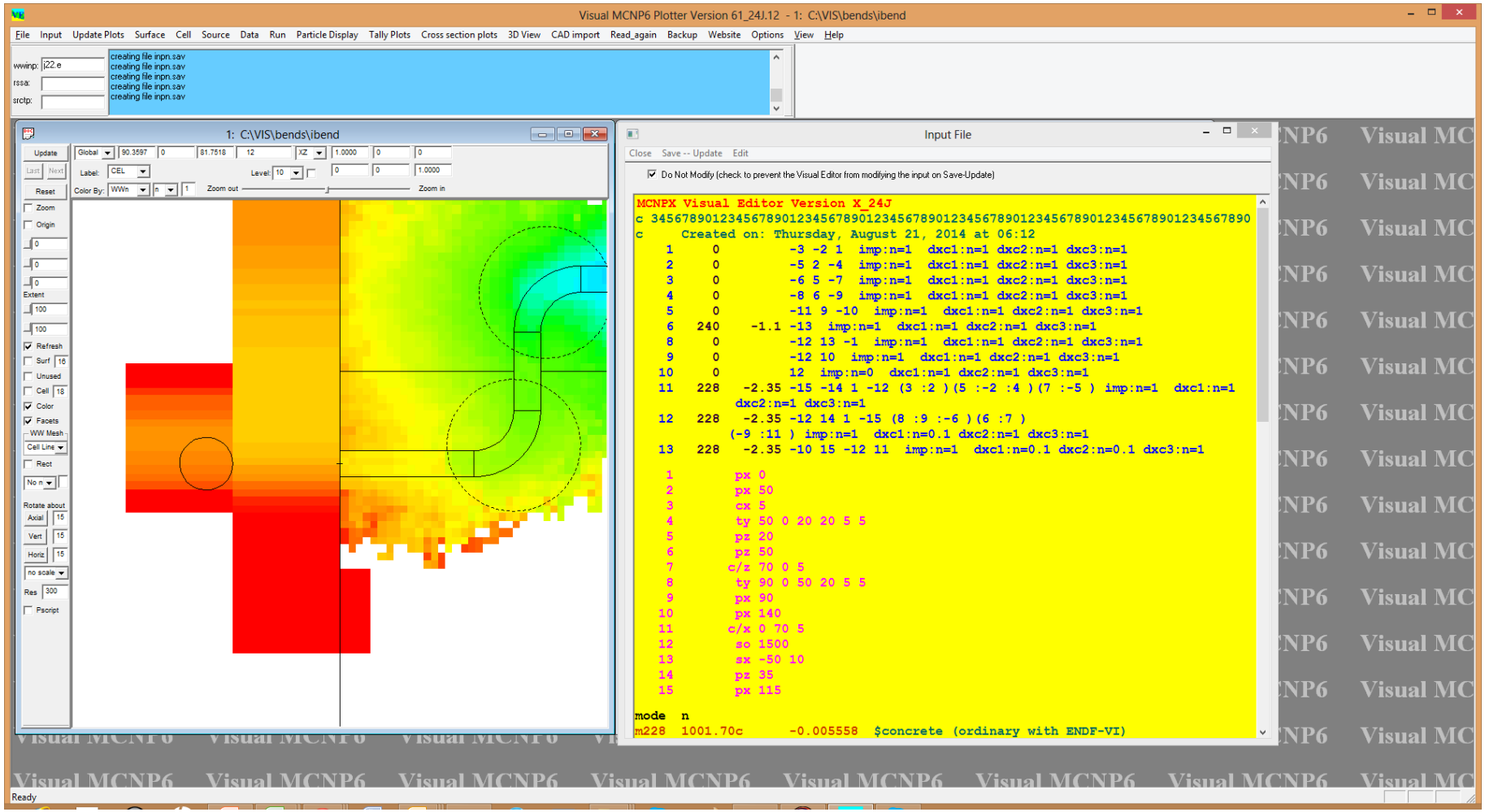


What is the Visual Editor?

1. **Visual Creation and Display of your Design.**



Creating Geometries Using the Visual Editor



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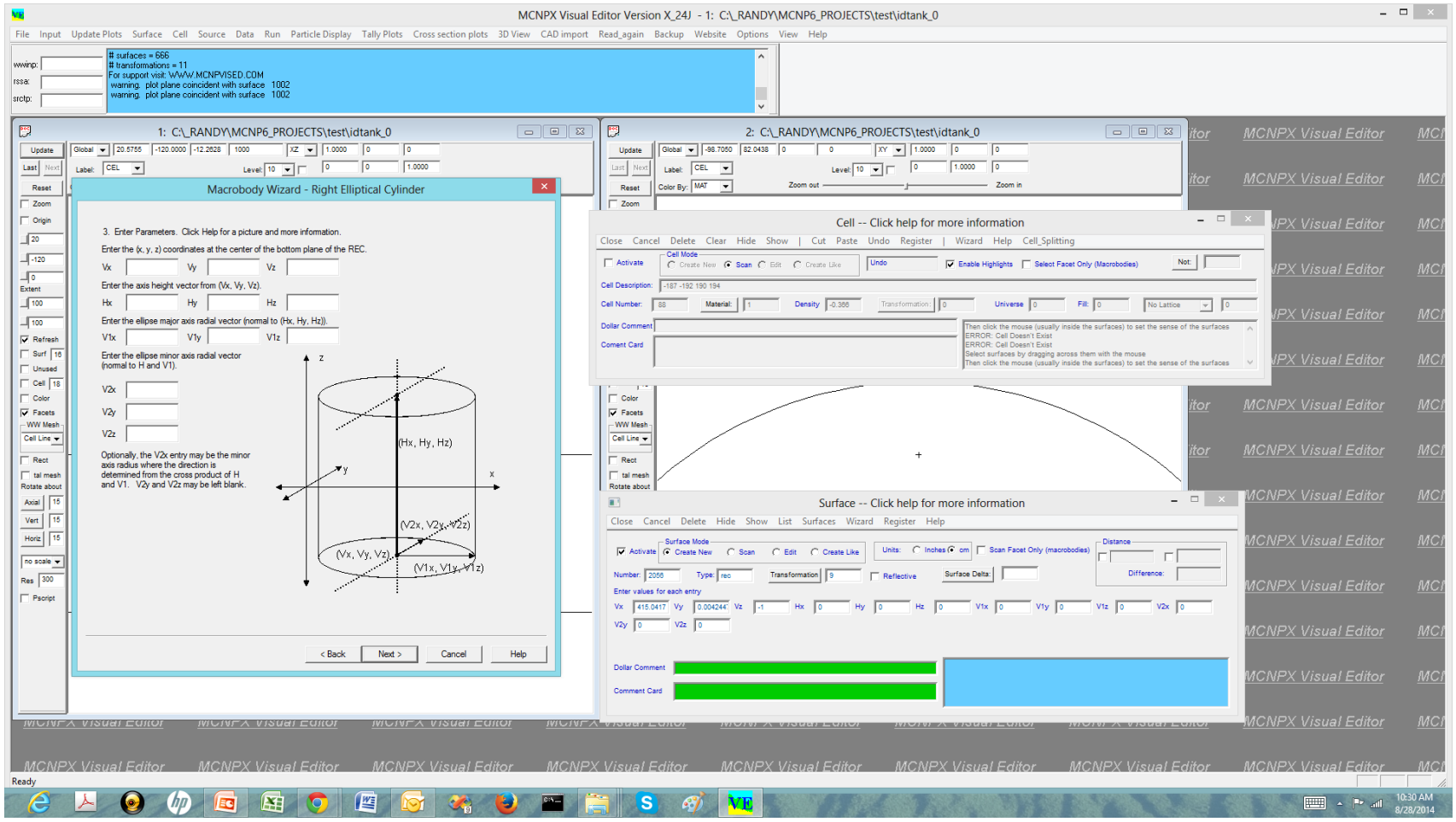

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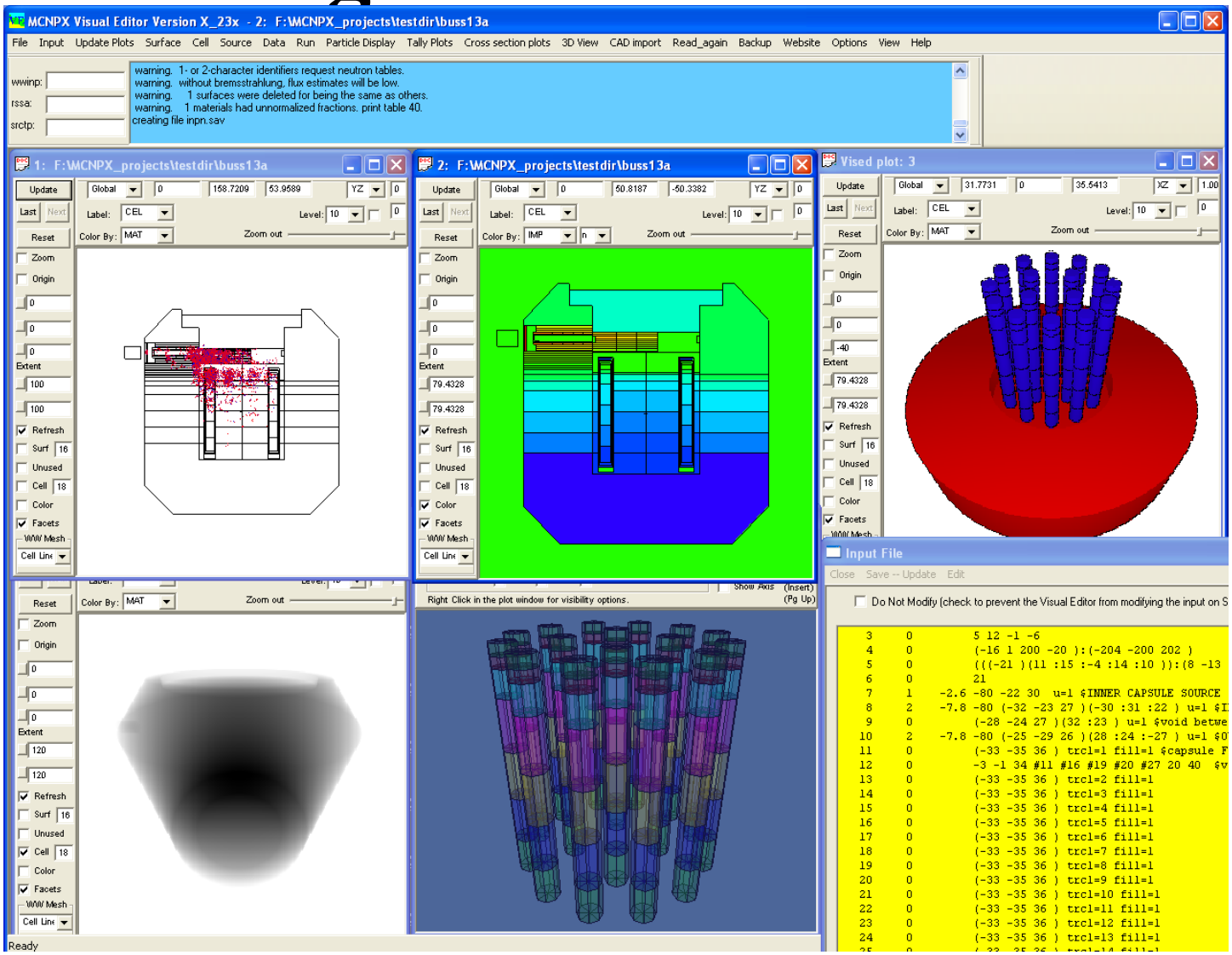
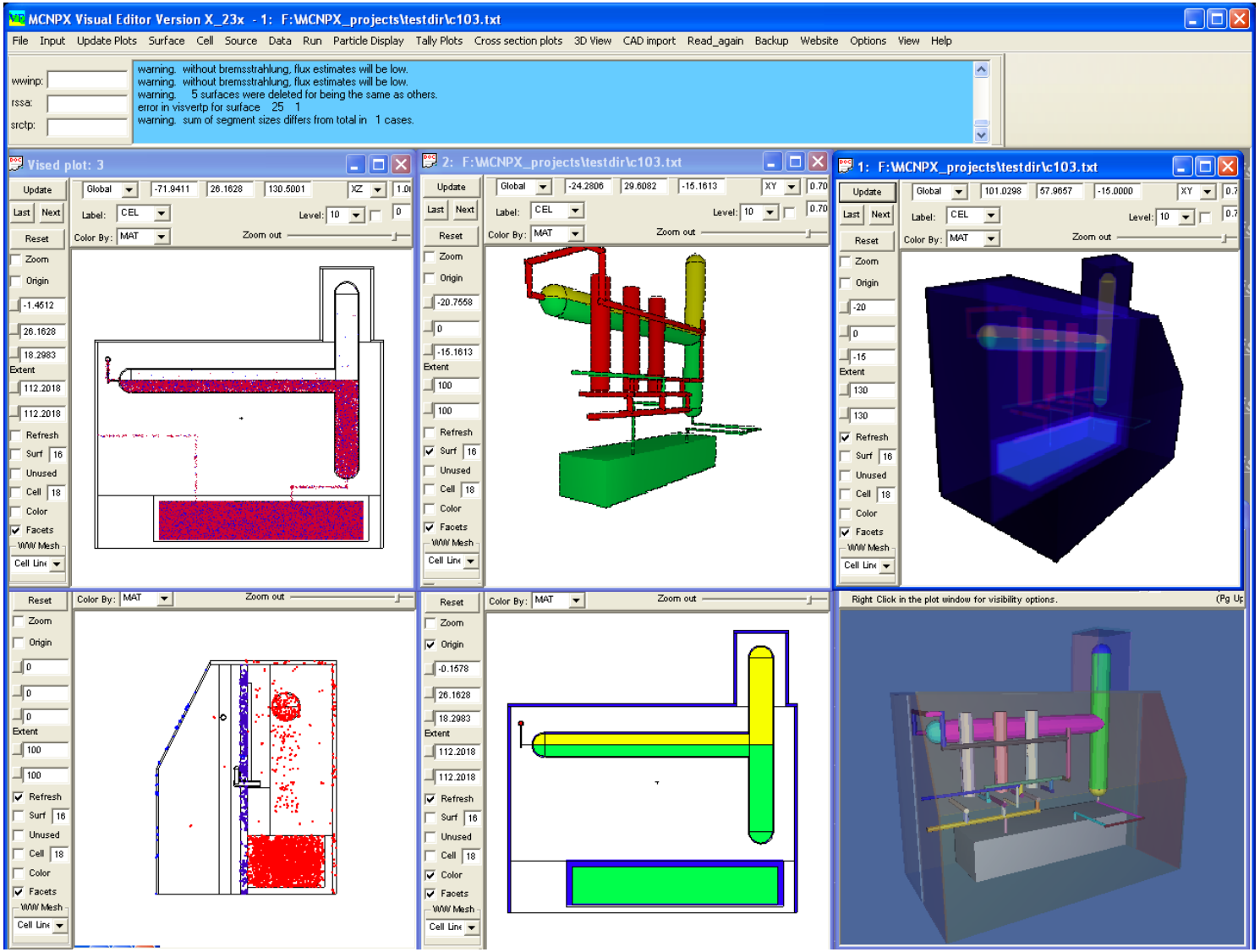
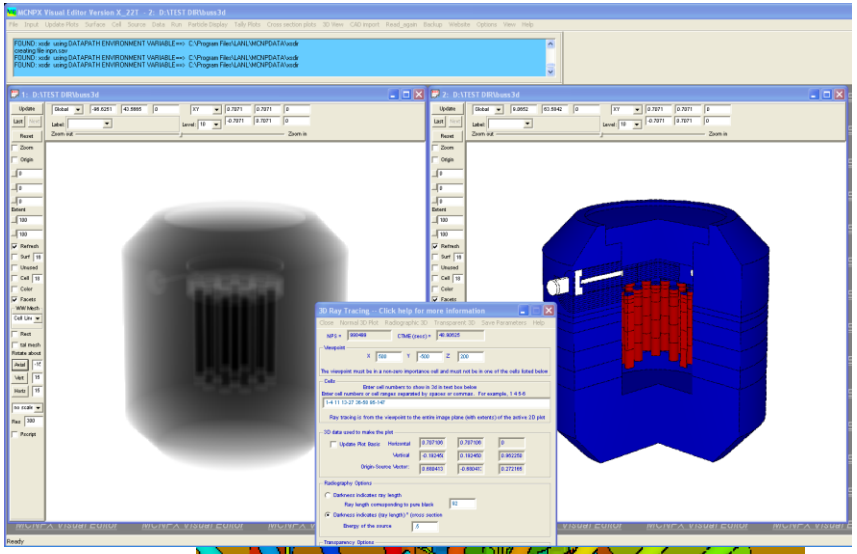
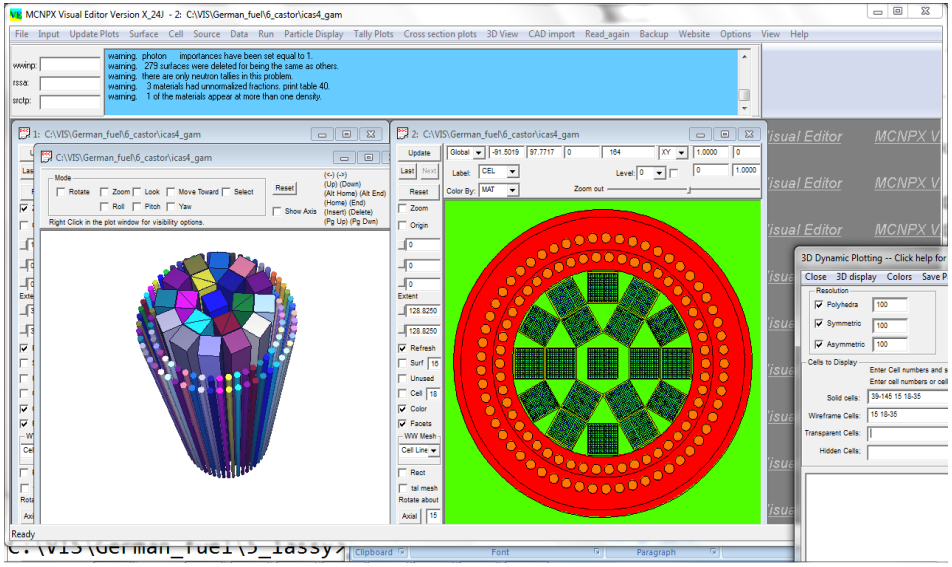


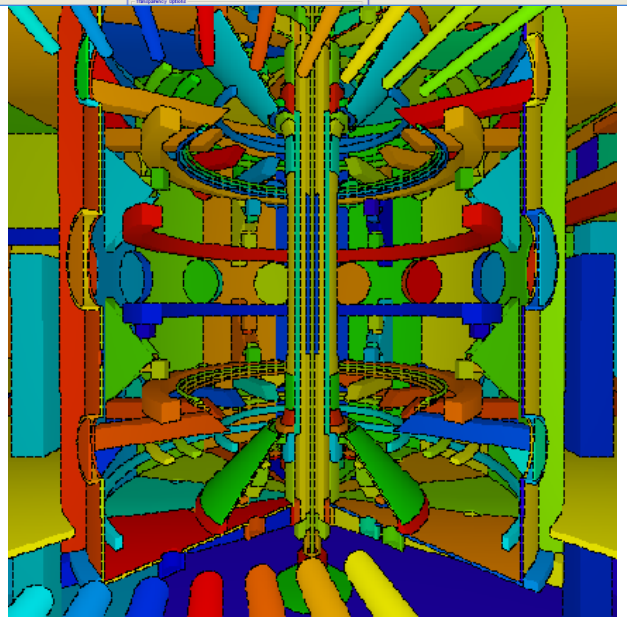
Creating Geometries Using the Visual Editor



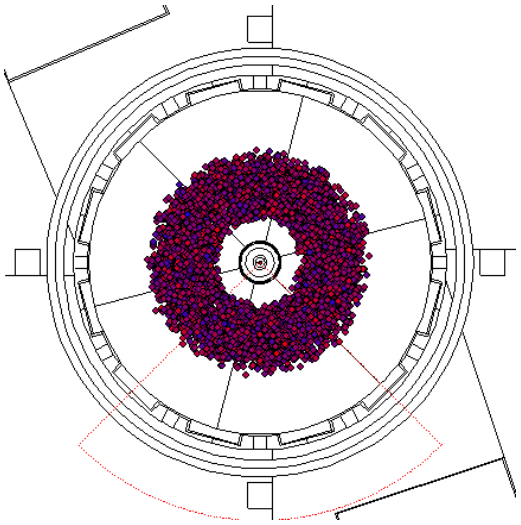
3D Display

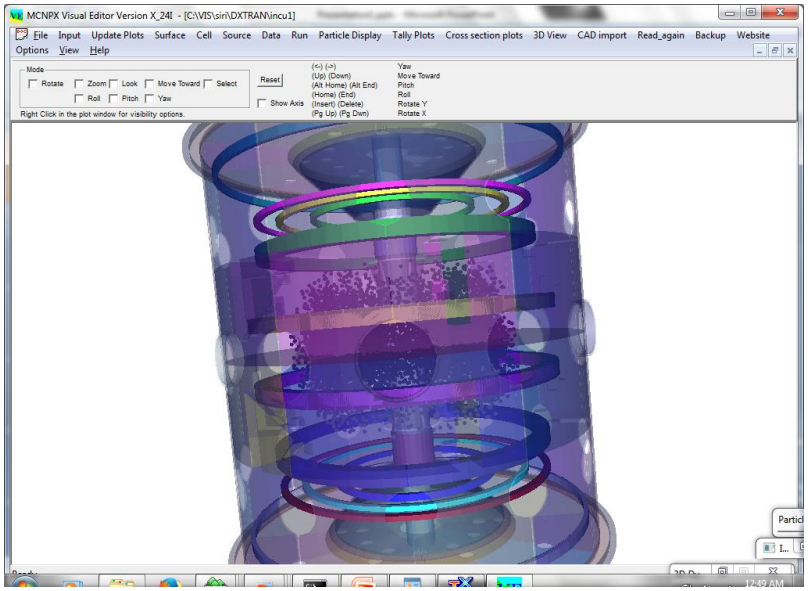


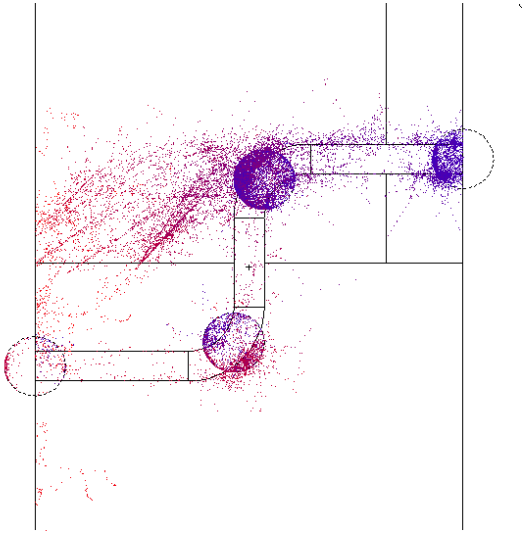


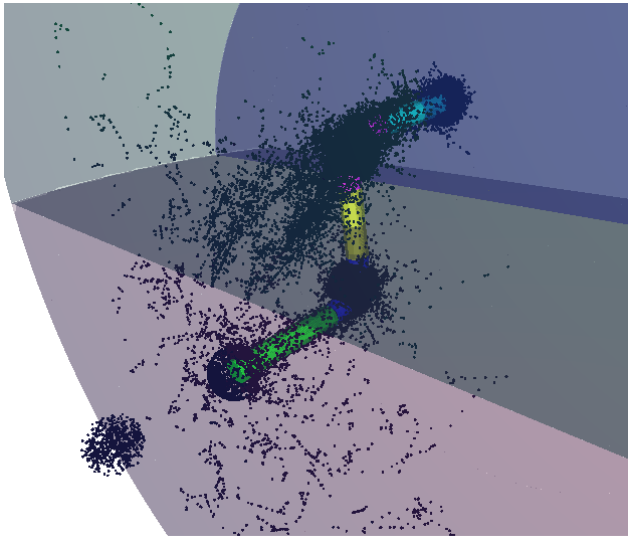


Particle Tracks



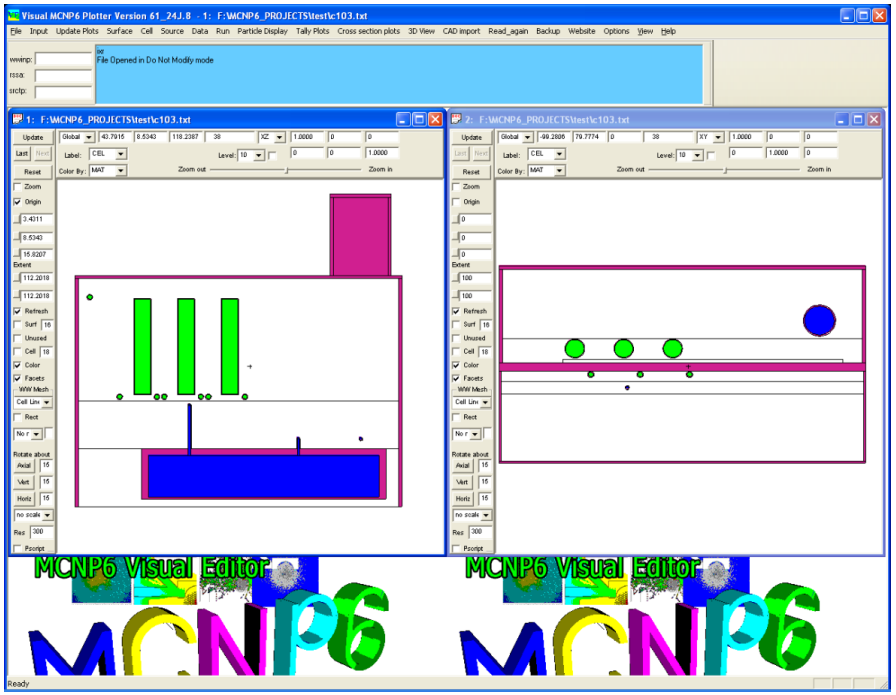




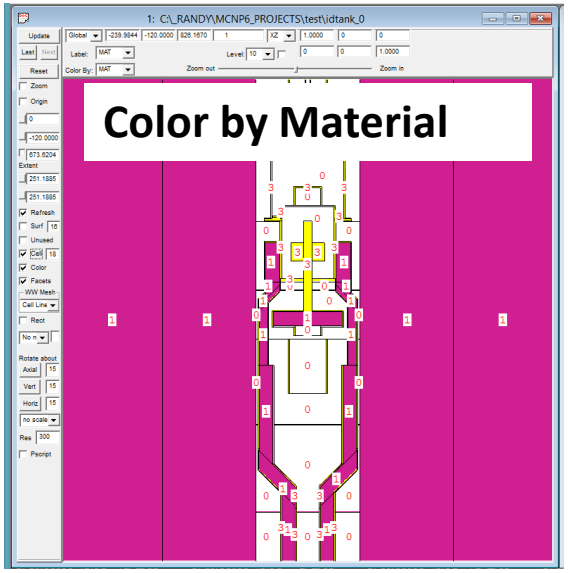


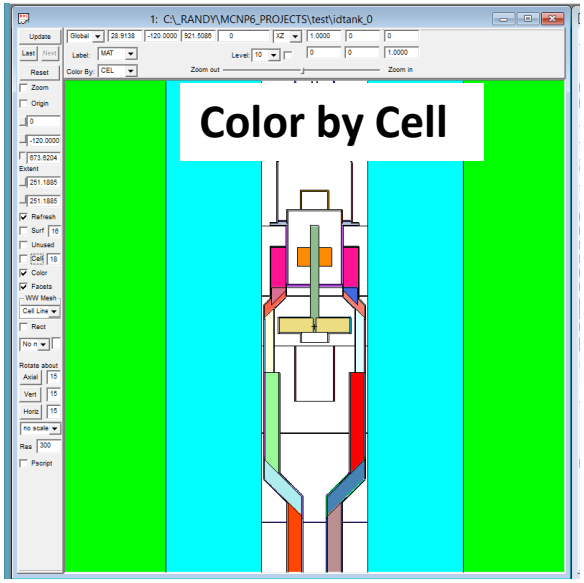
What is the Visual Plotter?

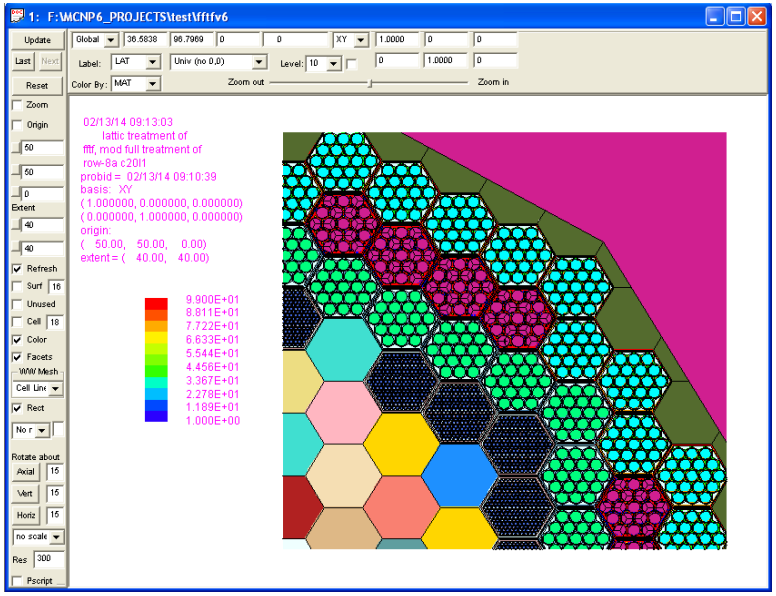
1. MCNP6 Plotter
    1. Geometry
    2. Tally
    3. Cross sections
2. Can not modify the input or create geometries.

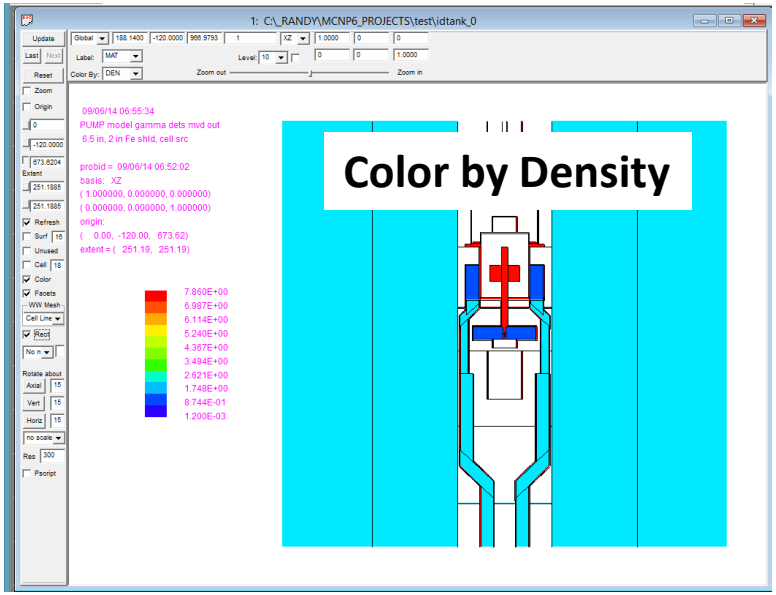


Geometry plots

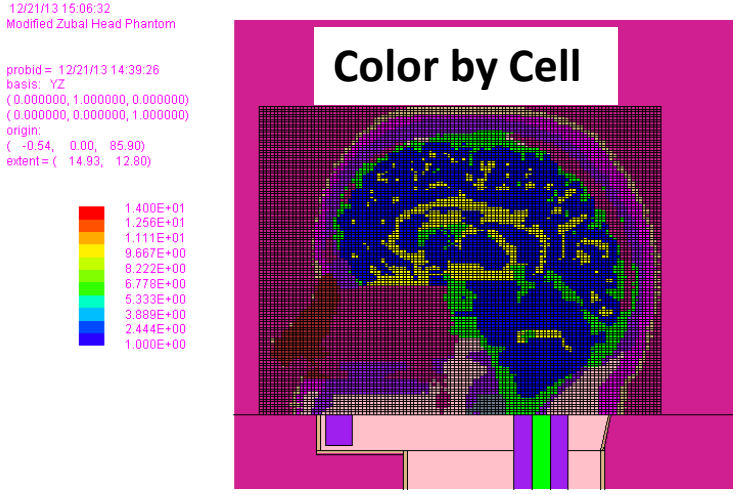


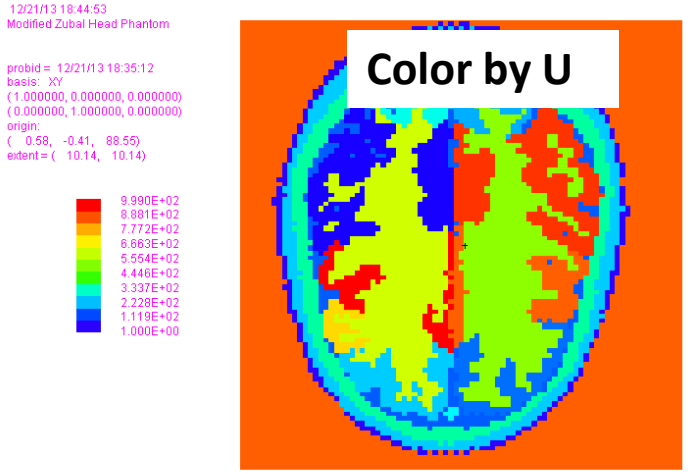


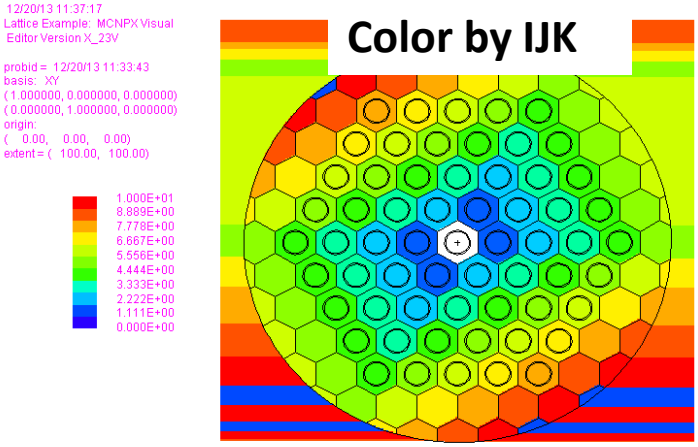


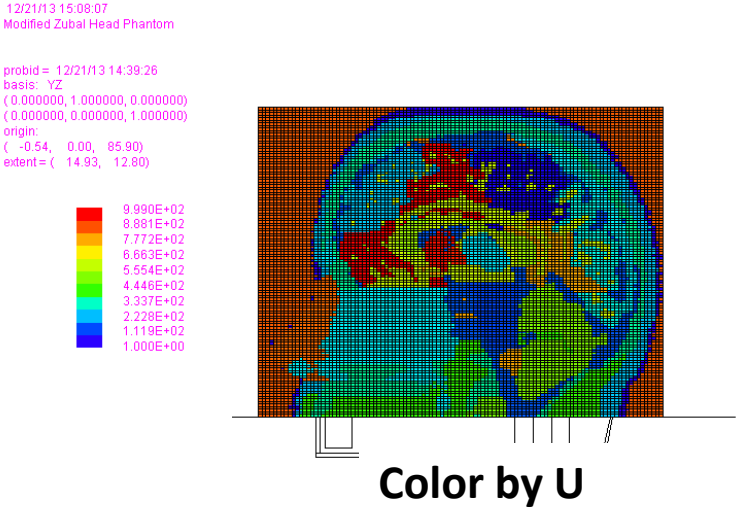


Geometry plots

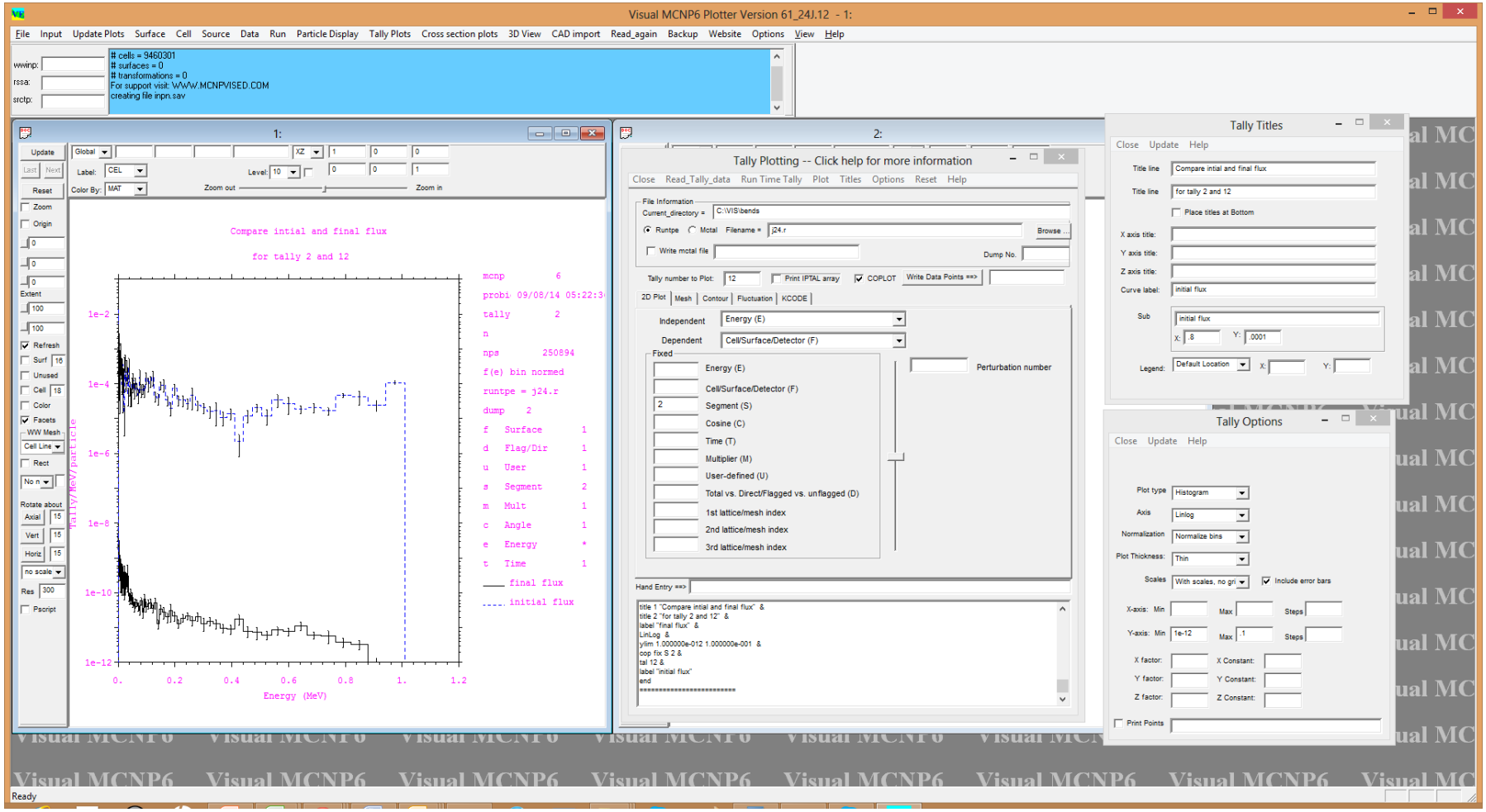




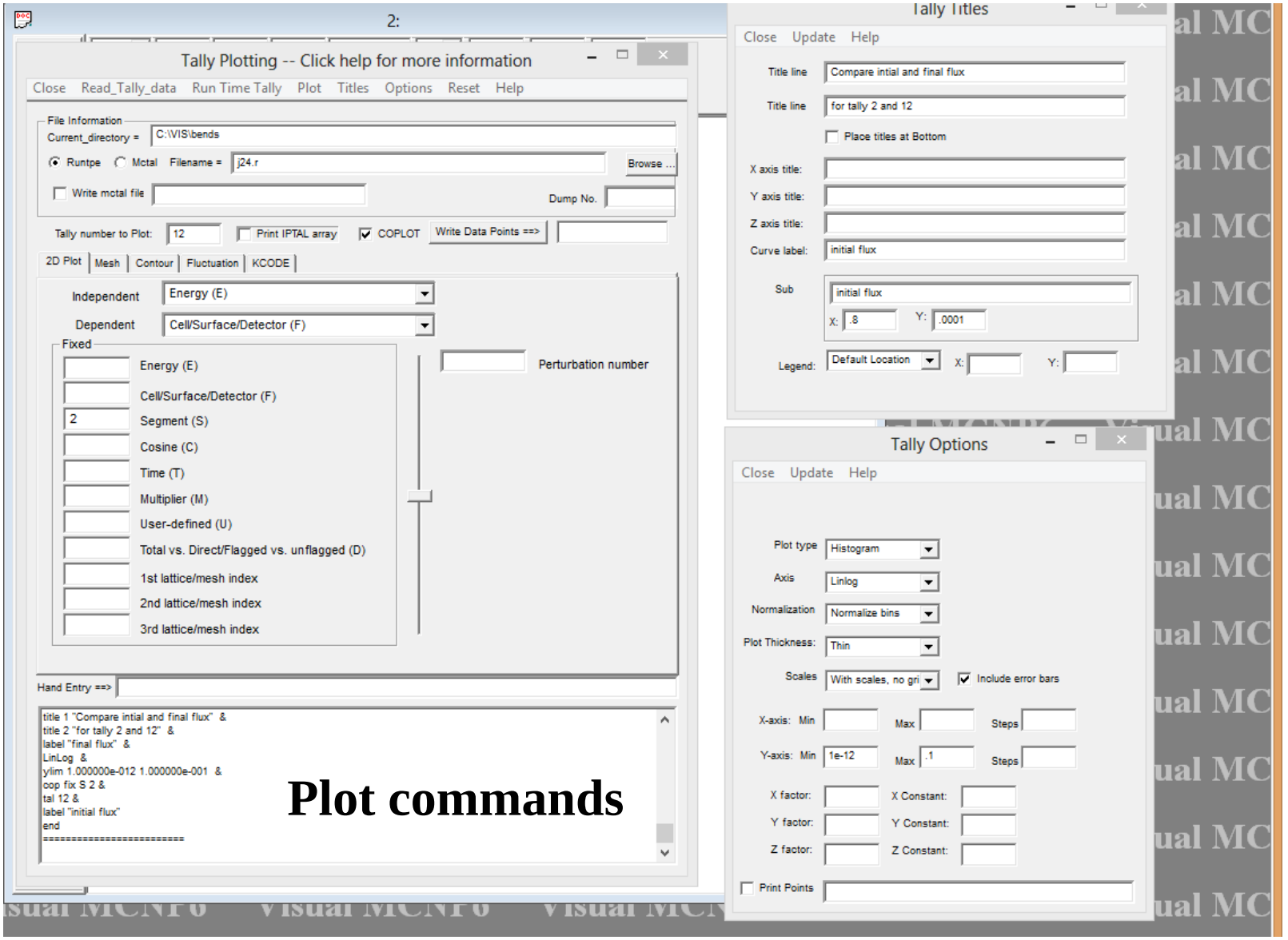




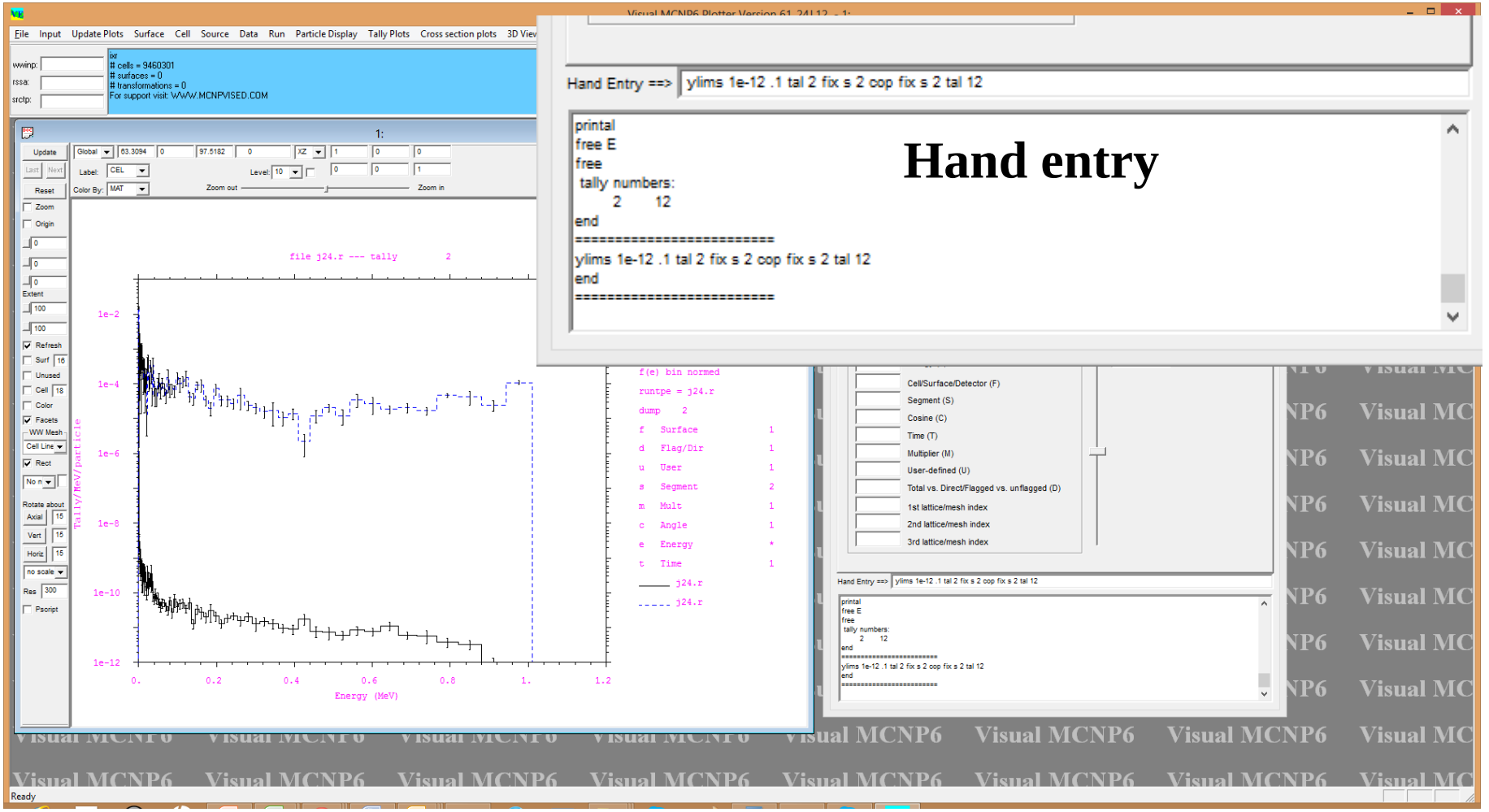
Tally Plots


Visual MCNP6 Plotter Version 61_24J.12 - 1:
File Input Update Plots Surface Cell Source Data Run Particle Display Tally Plots Cross section plots 3D View CAD import Read_again Backup Website Options View Help
cells = 9460301
surfaces = 0
transformations = 0
For support visit: WWW.MCNPVISED.COM
creating file inpn.sav
1:
Compare intial and final flux
for tally 2 and 12
Tally/MeV/particle
Energy (MeV)
final flux
initial flux
2:
Tally Plotting -- Click help for more information
Close Read_Tally_data Run Time Tally Plot Titles Options Reset Help
Tally Titles
Close Update Help
Compare intial and final flux
for tally 2 and 12
initial flux
Tally Options
Close Update Help
Histogram
Linlog
Normalize bins
Thin
Ready

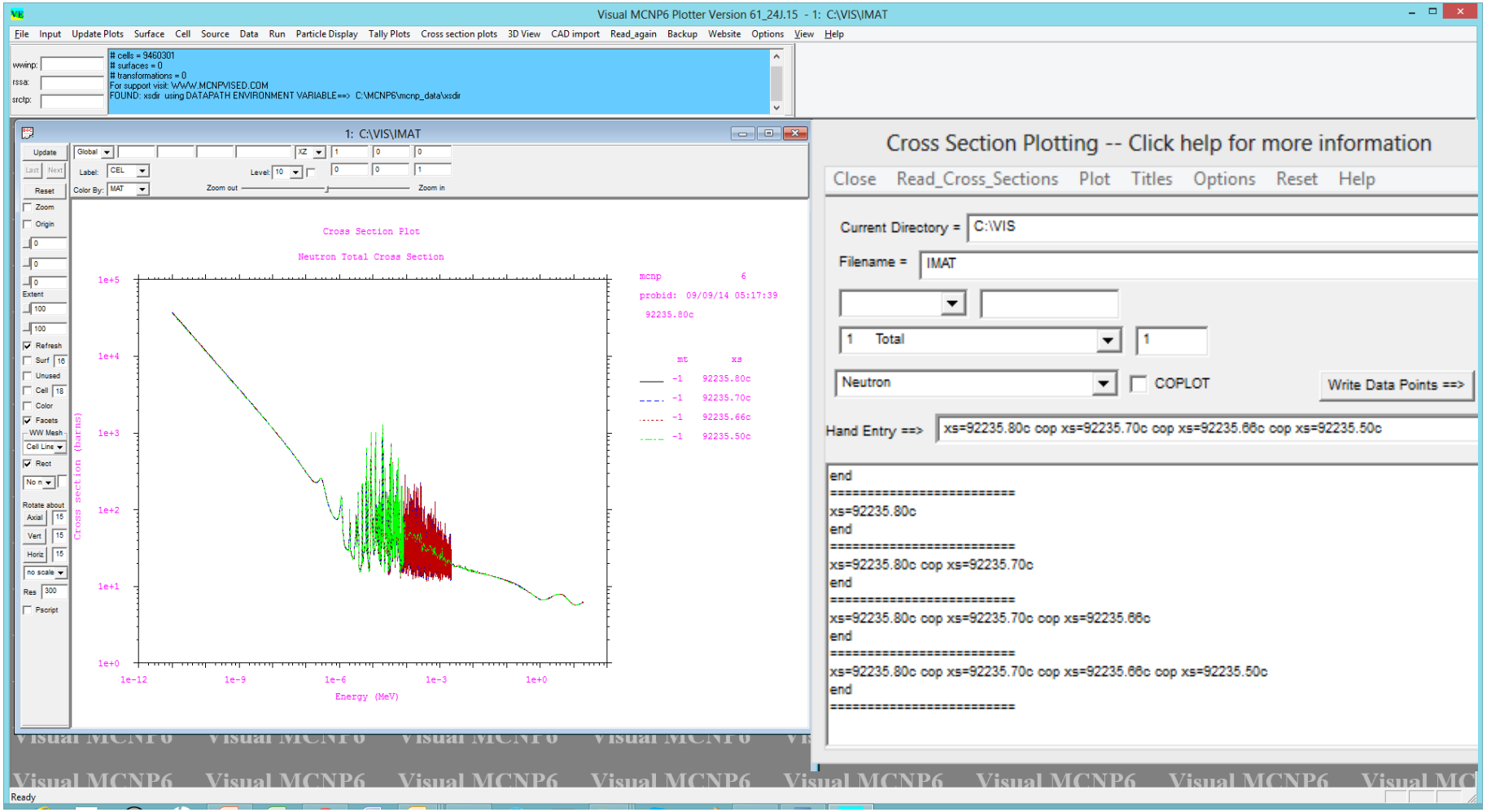
Tally Plots


2:
Tally Plotting -- Click help for more information
Close Read_Tally_data Run Time Tally Plot Titles Options Reset Help
File Information
Current_directory = C:\VIS\bends
Runtpe Mctal Filename = j24.r
Browse ...
Write mctal file
Dump No.
Tally number to Plot: 12
Print IPTAL array
COPLOT
Write Data Points ==>
2D Plot Mesh Contour Fluctuation KCODE
Independent Energy (E)
Dependent Cell/Surface/Detector (F)
Fixed
Energy (E)
Cell/Surface/Detector (F)
2
Segment (S)
Cosine (C)
Time (T)
Multiplier (M)
User-defined (U)
Total vs. Direct/Flagged vs. unflagged (D)
1st lattice/mesh index
2nd lattice/mesh index
3rd lattice/mesh index
Perturbation number
Hand Entry ==>
title 1 "Compare intial and final flux" &
title 2 "for tally 2 and 12" &
label "final flux" &
LinLog &
ylim 1.000000e-012 1.000000e-001 &
cop fix S 2 &
tal 12 &
label "initial flux"
end
==========
Plot commands
Tally Titles
Close Update Help
Title line Compare intial and final flux
Title line for tally 2 and 12
Place titles at Bottom
X axis title:
Y axis title:
Z axis title:
Curve label: initial flux
Sub initial flux
X: .8 Y: .0001
Legend: Default Location X: Y:
Tally Options
Close Update Help
Plot type Histogram
Axis Linlog
Normalization Normalize bins
Plot Thickness: Thin
Scales With scales, no gri
Include error bars
X-axis: Min Max Steps
Y-axis: Min 1e-12 Max .1 Steps
X factor: X Constant:
Y factor: Y Constant:
Z factor: Z Constant:
Print Points

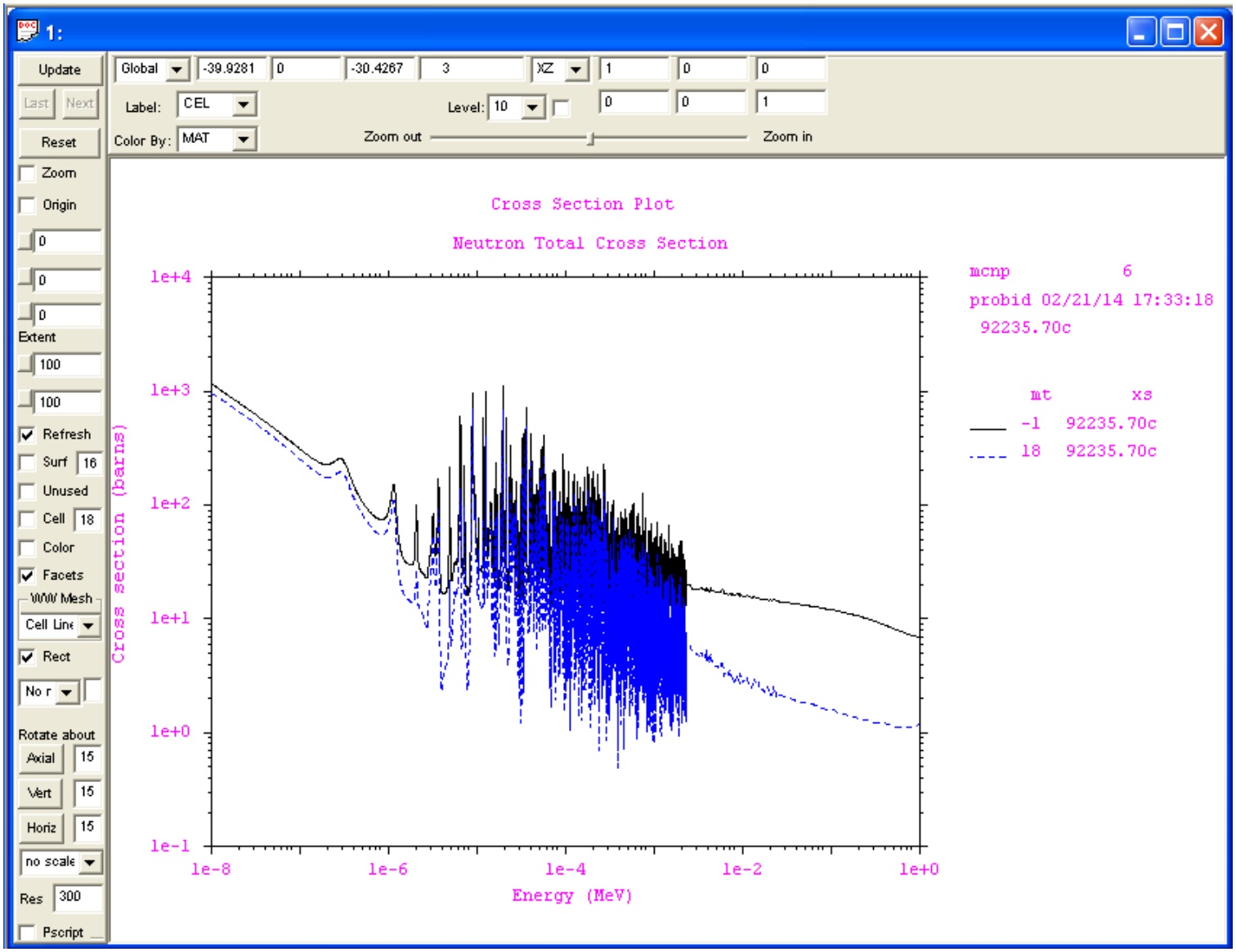
Tally Plots


Hand Entry ==> ylims 1e-12 .1 tal 2 fix s 2 cop fix s 2 tal 12
printal
free E
free
tally numbers:
2 12
end
==========
ylims 1e-12 .1 tal 2 fix s 2 cop fix s 2 tal 12
end
==========
Hand entry
file j24.r --- tally 2
Tally/MeV/particle
Energy (MeV)
f(e) bin normed
runtpe = j24.r
dump 2
f Surface 1
d Flag/Dir 1
u User 1
s Segment 2
m Mult 1
c Angle 1
e Energy *
t Time 1
j24.r
j24.r
Cell/Surface/Detector (F)
Segment (S)
Cosine (C)
Time (T)
Multiplier (M)
User-defined (U)
Total vs. Direct/Flagged vs. unflagged (D)
1st lattice/mesh index
2nd lattice/mesh index
3rd lattice/mesh index
Visual MCNP6
Ready

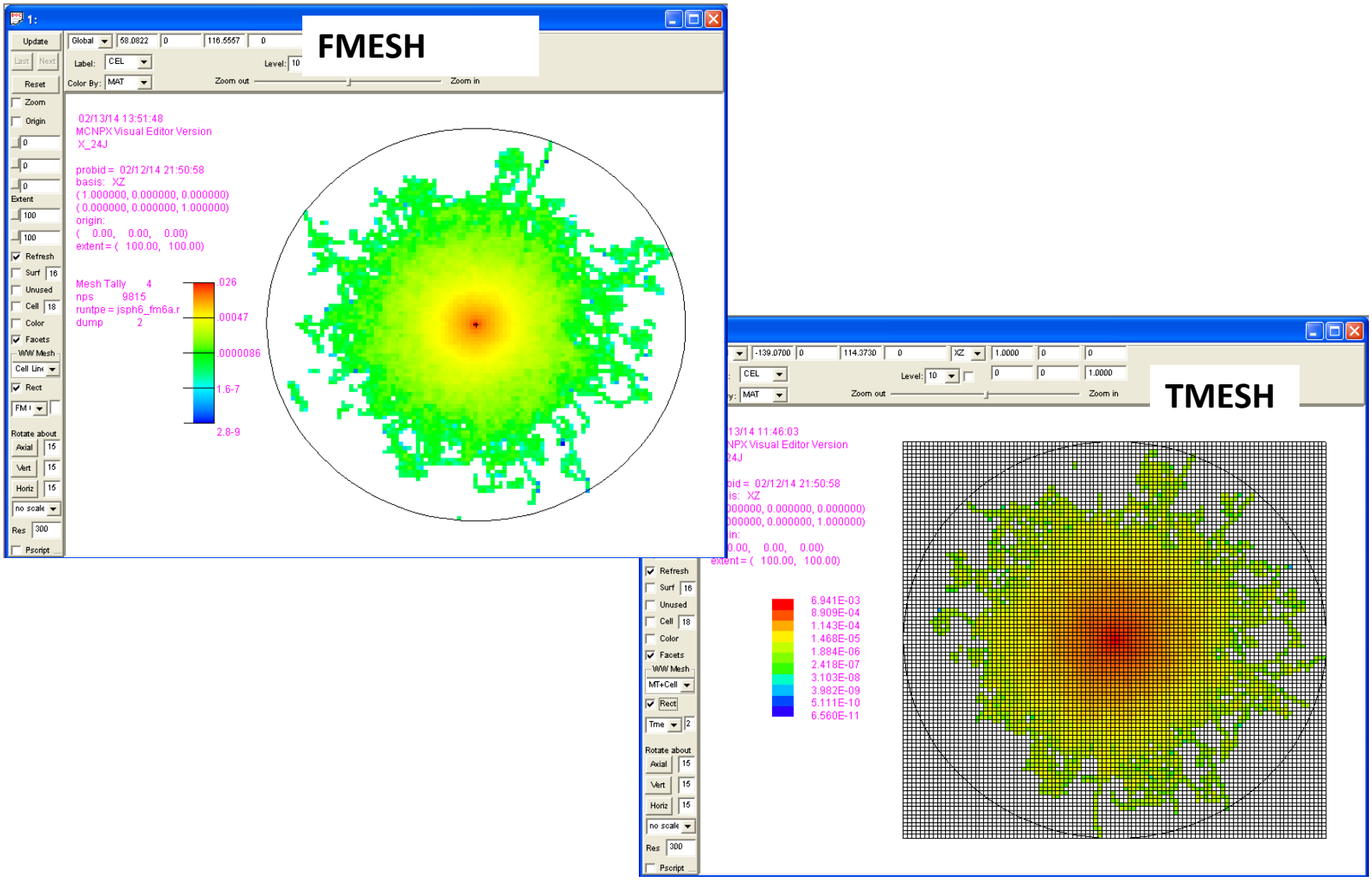
Cross Section Plots



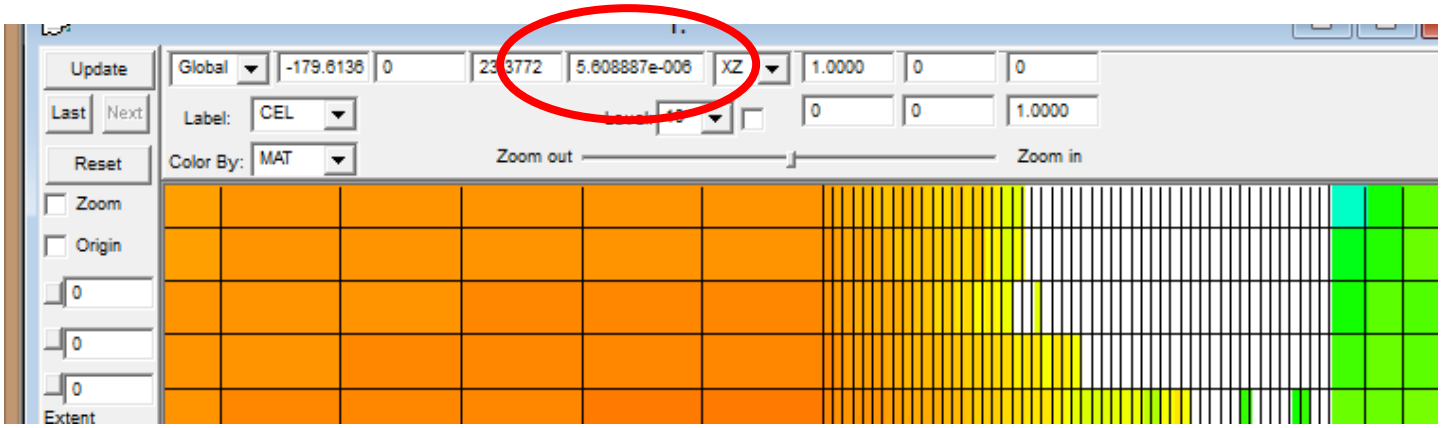
Cross Section Plots



Mesh Tally Plots

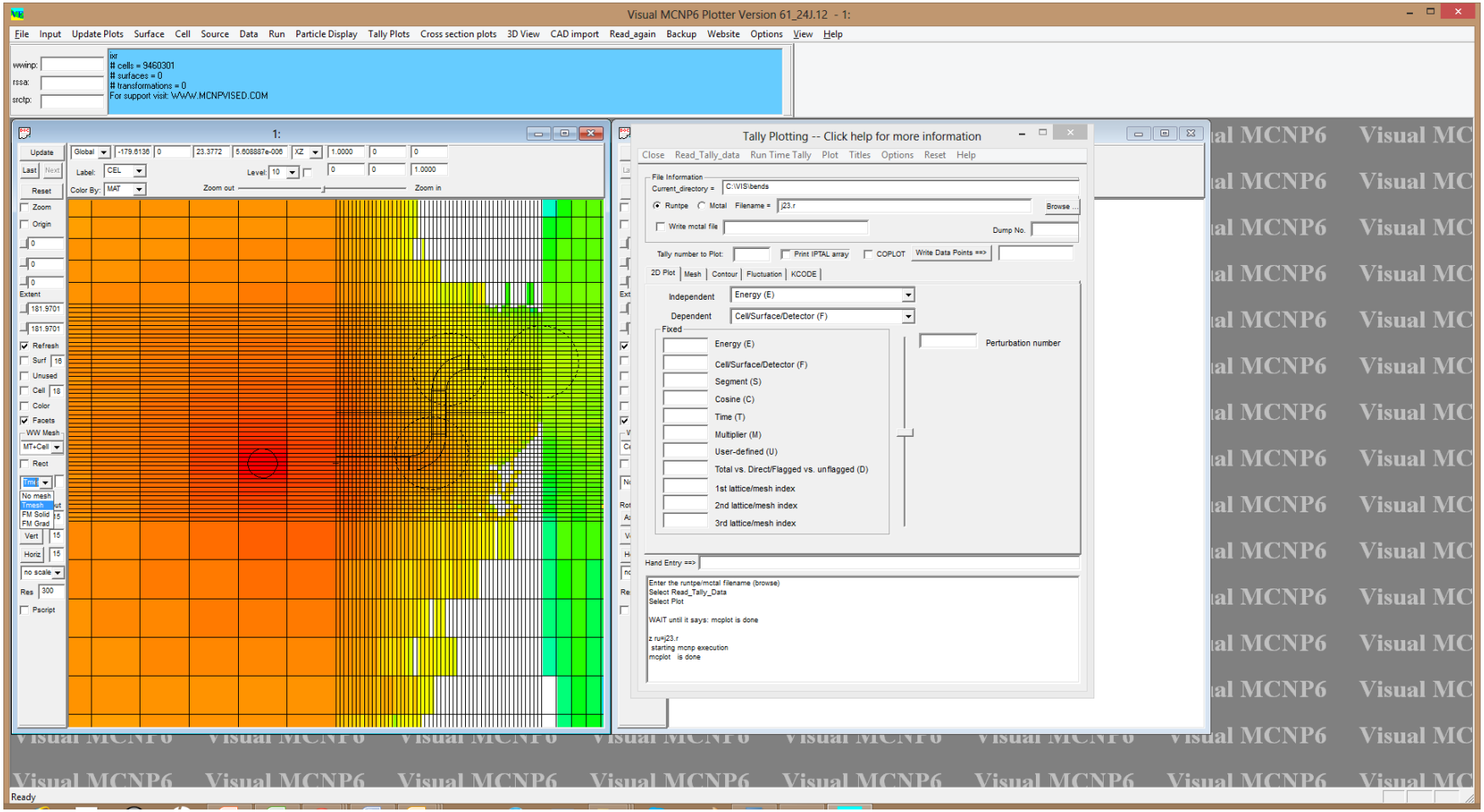


Tmesh Tally Plots

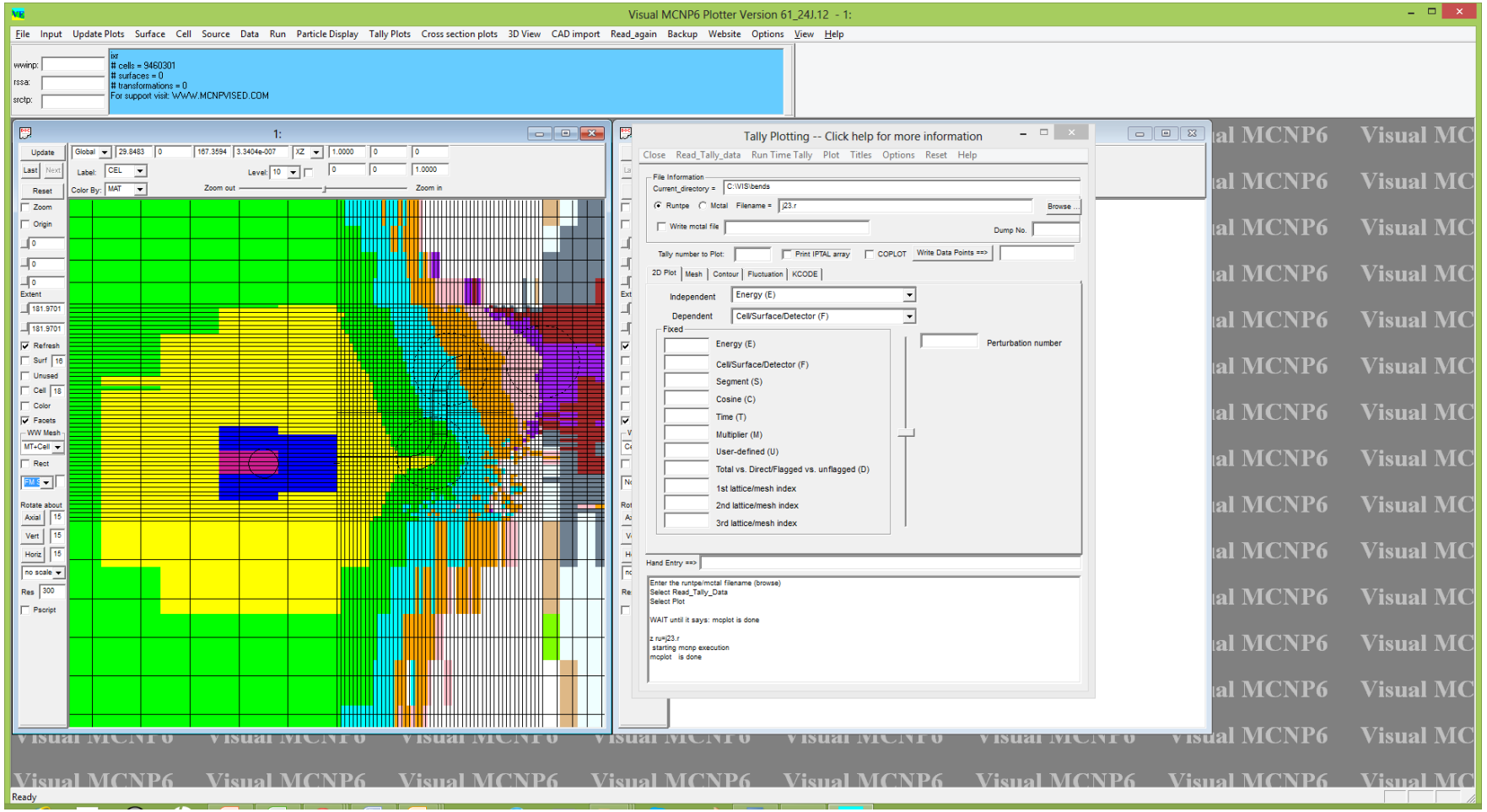


1. **Mesh tally data values are displayed**
2. **All mesh plotting options available as part of the geometry plotter.**

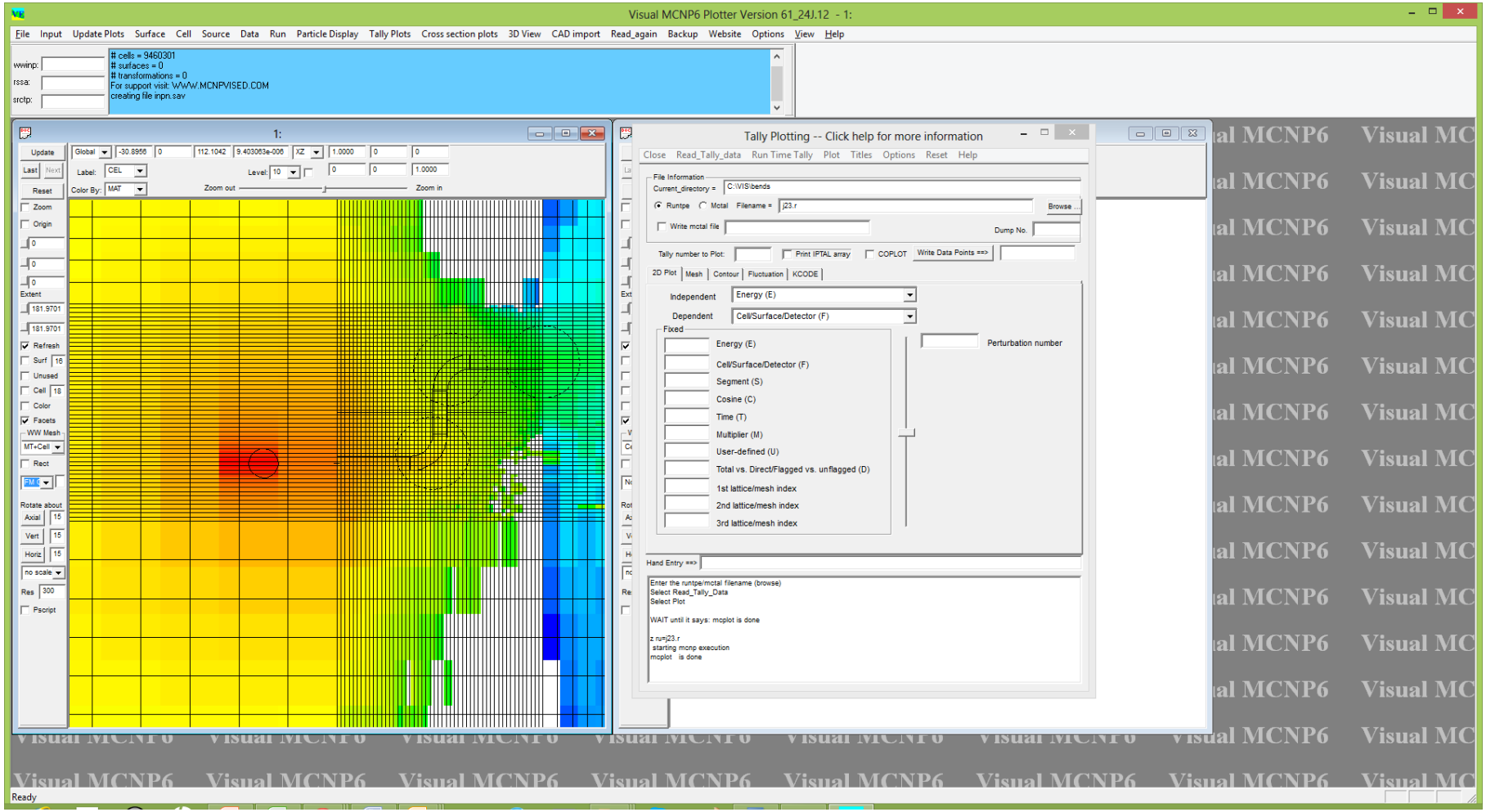
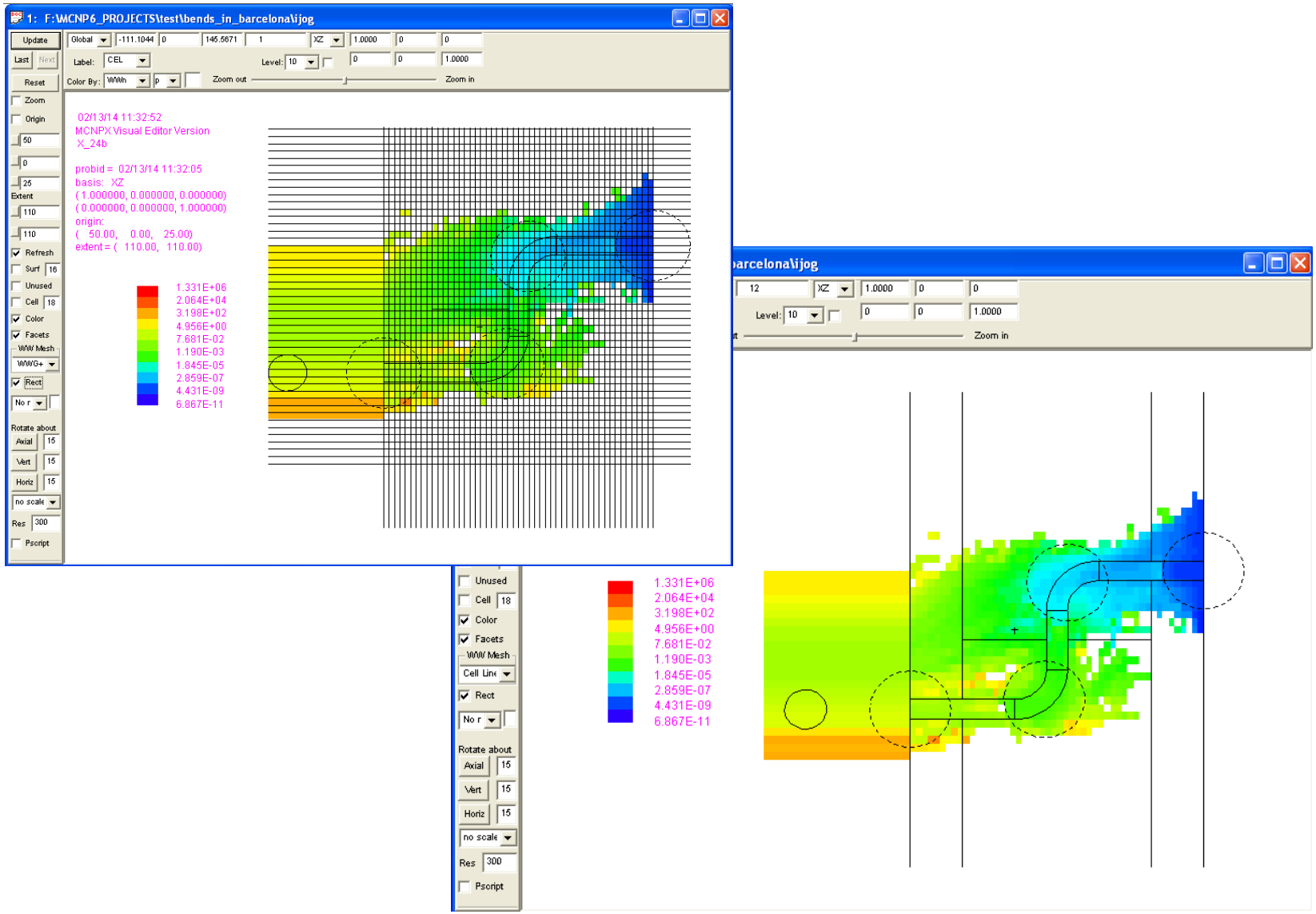
Tmesh Tally Plots



Fmesh Solid Tally Plot



Fmesh Gradient Tally Plot



Weight Window Mesh Plots