

LA-UR-07-2777

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<i>Title:</i>	MCNP Medical Physics Database
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MCNP Medical Physics Geometry Database

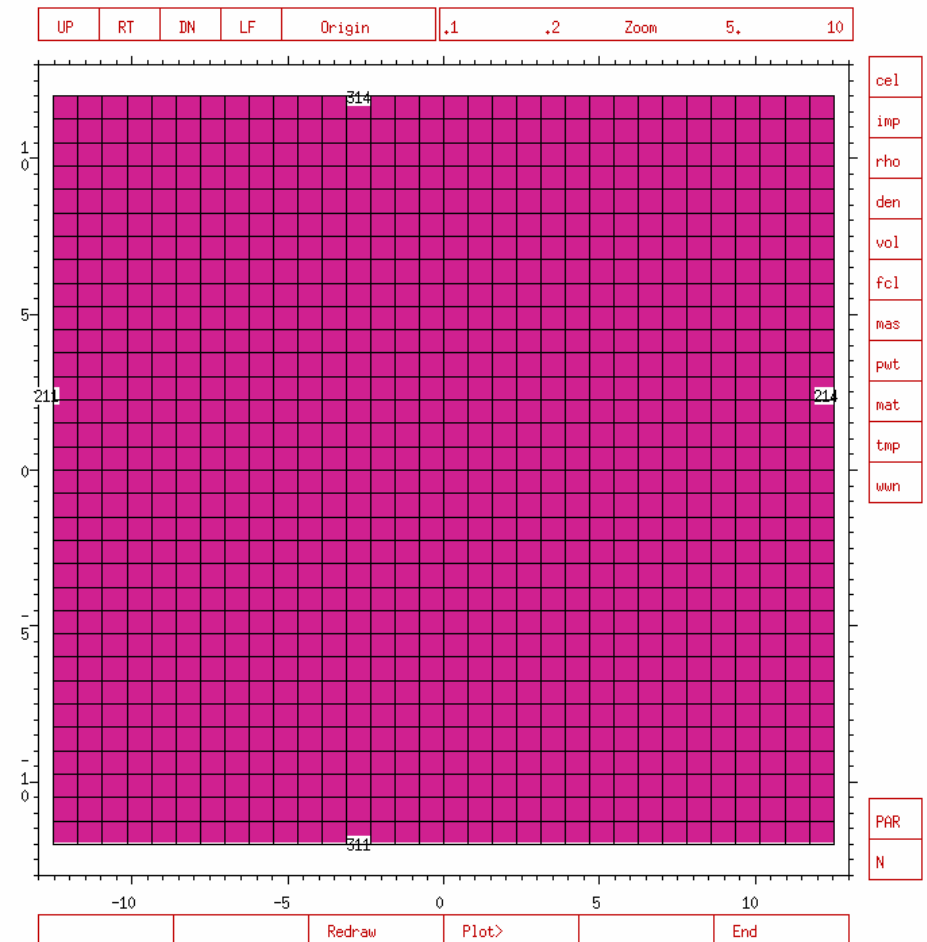
Abstract:

With the growing interest in using MCNP for medical physics calculations, demand has been increasing for geometric models which represent various portions of the human body. This database of analytical and voxelized (possibly based on CT data) geometries, in mcnp input deck form, would help to meet that need. They could be used for organ-specific dose calculations, code comparisons, or geometric representation studies. Contributions to this database are welcome. For more information, contact jgoorley@lanl.gov.

LA-UR-04-8518, LA-UR-05-6921, LA-UR-06-8172, LA-UR-07-2777

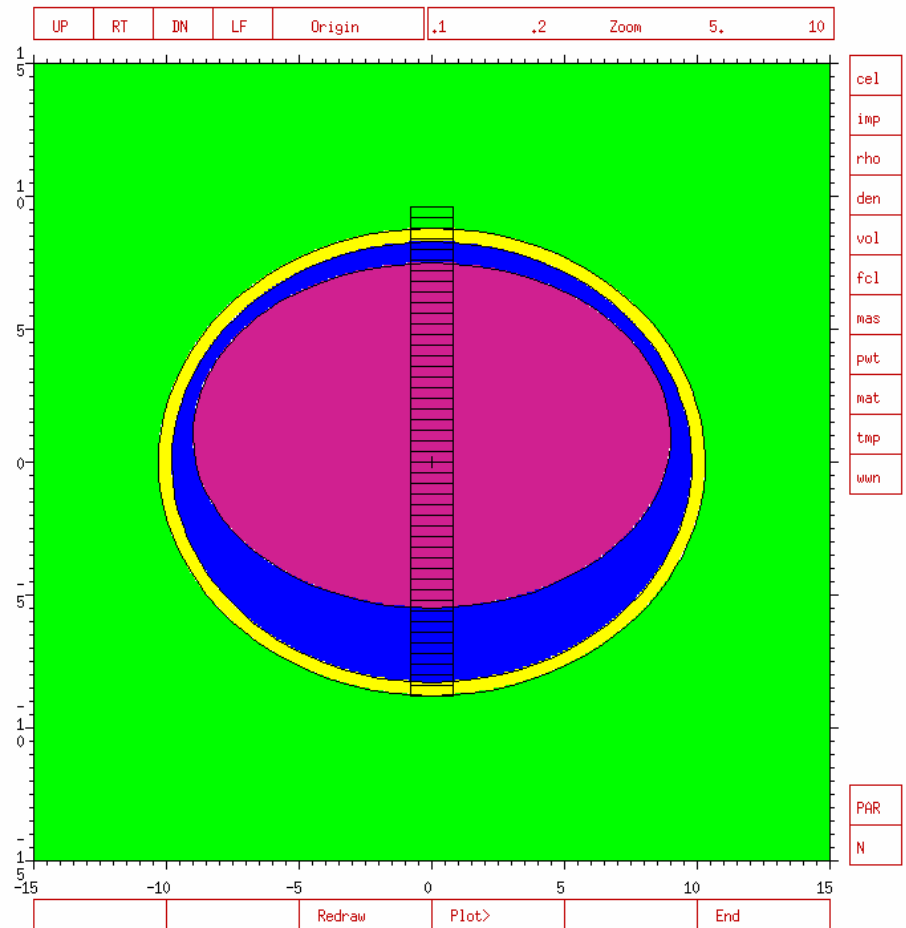
Cubes

- Tissue or Water cubes
- Same total size, different voxel sizes
- Uses lattice geometry



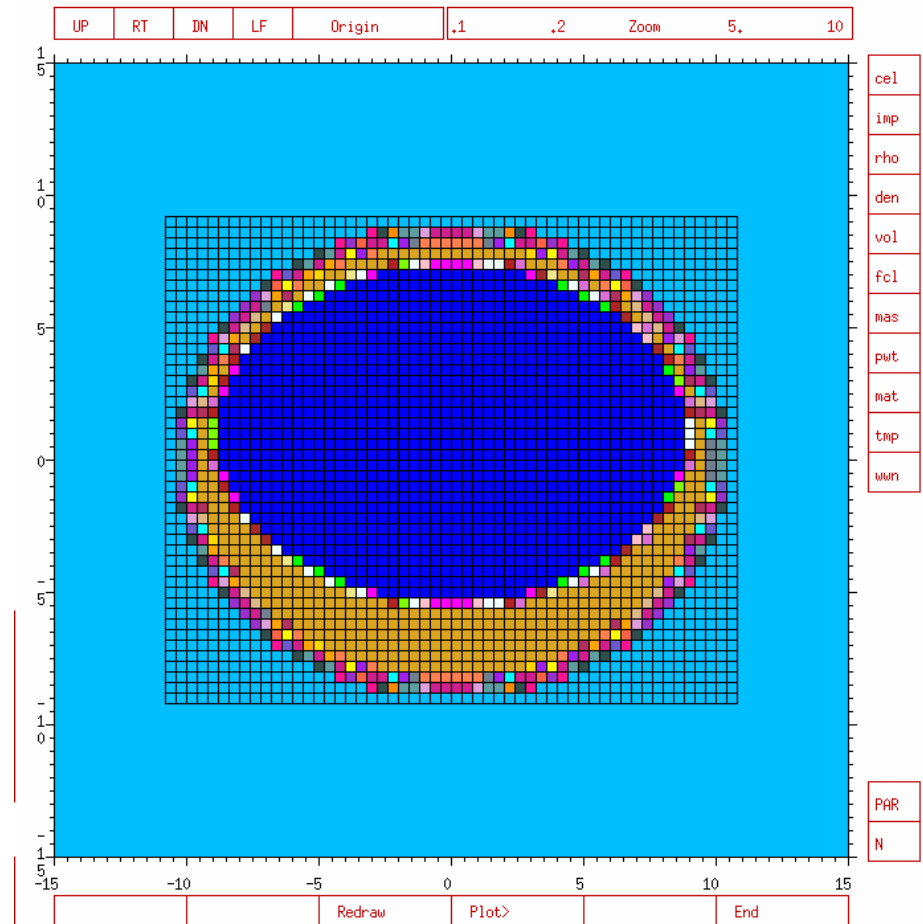
Snyder HP - Analytical

- Snyder head phantom w/ scalp
- Analytical geometry
- 3 materials
- Tallies along z-axis



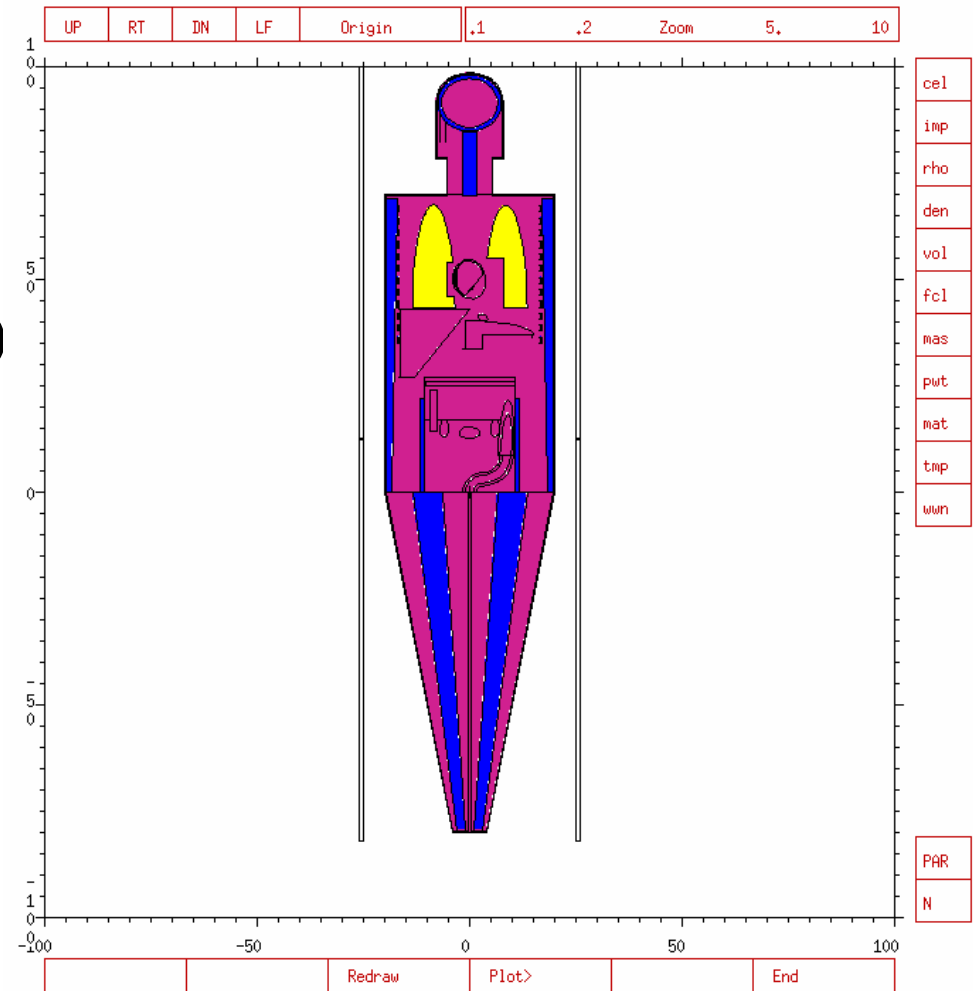
Snyder HP - Voxel

- Snyder head phantom w/ scalp
- Voxel/Lattice geometry
- 4, 8, or 16 mm cubes
- Homogenized Materials



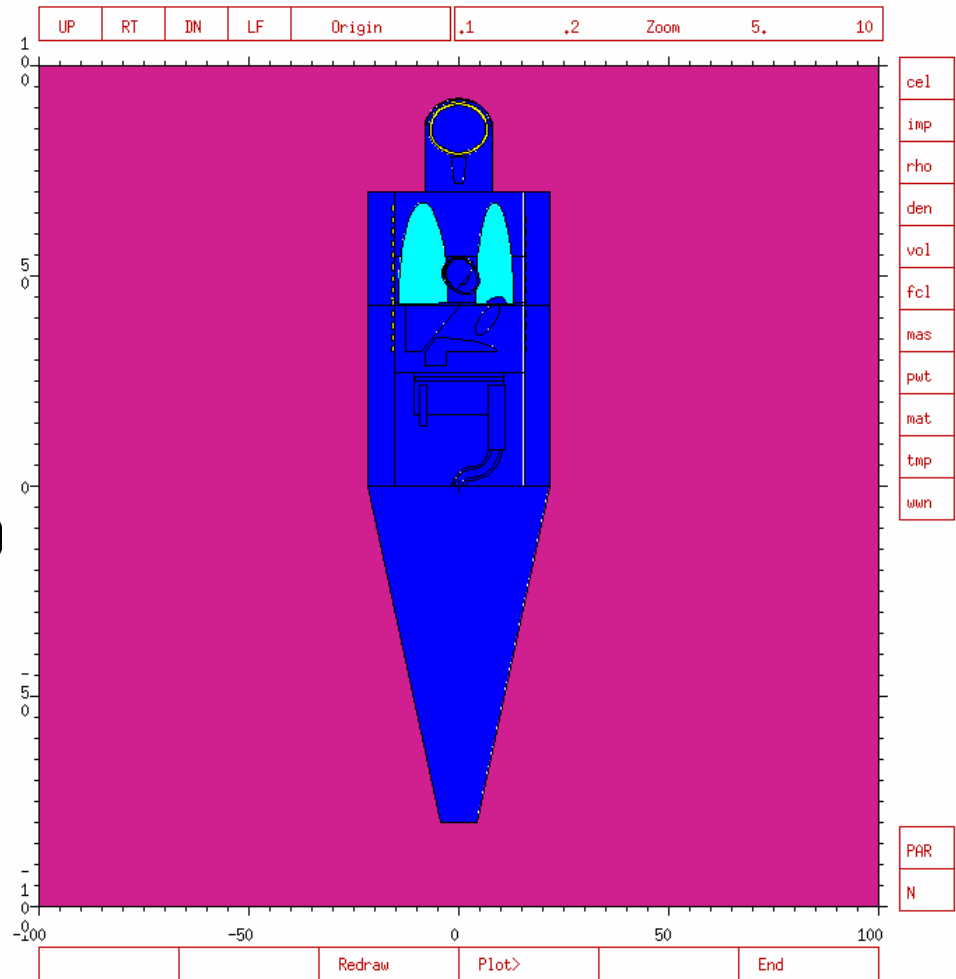
MIRD12 (ORNL)

- ORNL 1996
- 35 discrete cells
- 3 mats (soft, bone, lung)



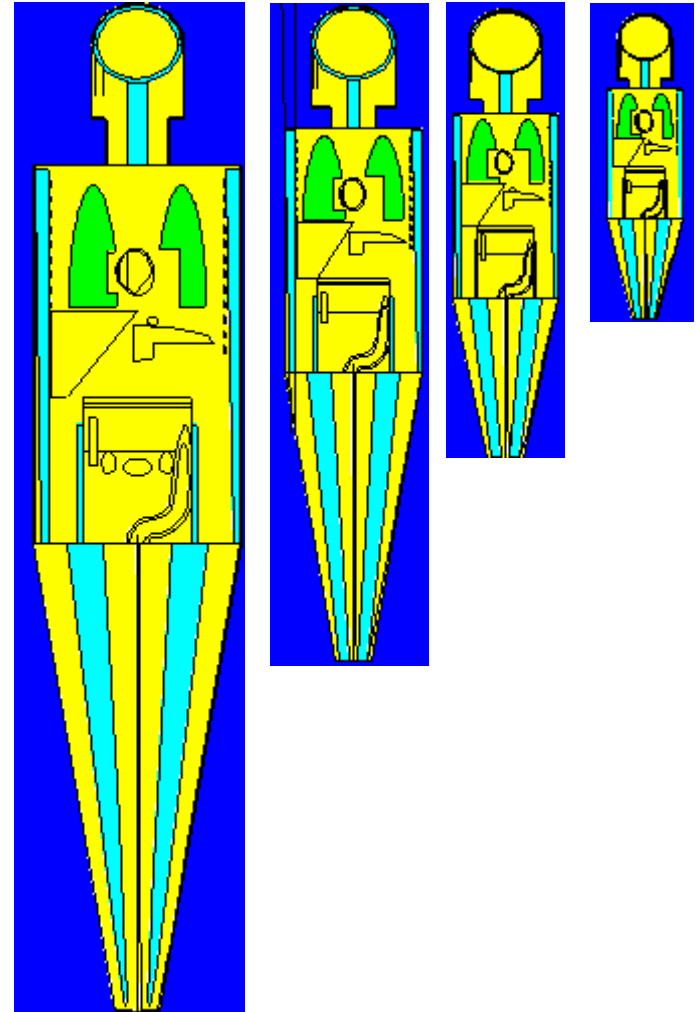
MIRD (Yanch)

- MIRD Like
- MCAT Phantom + 5 organs
- 60 discrete cells
- 3 mats (soft, bone, lung)
- Prof. Yanch, MIT



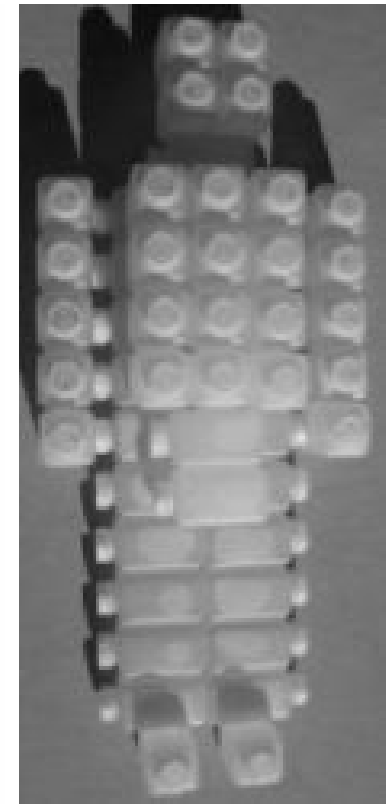
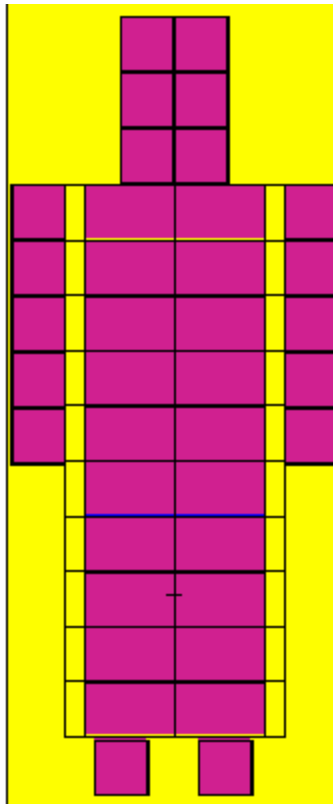
MIRD Humans

- Male, Female
- Children: 1, 5, 10, 15
- 40+ discrete cells
- 3 Materials
- D. Krstic and D. Nikezic,
U. of Kragujevac, Serbia



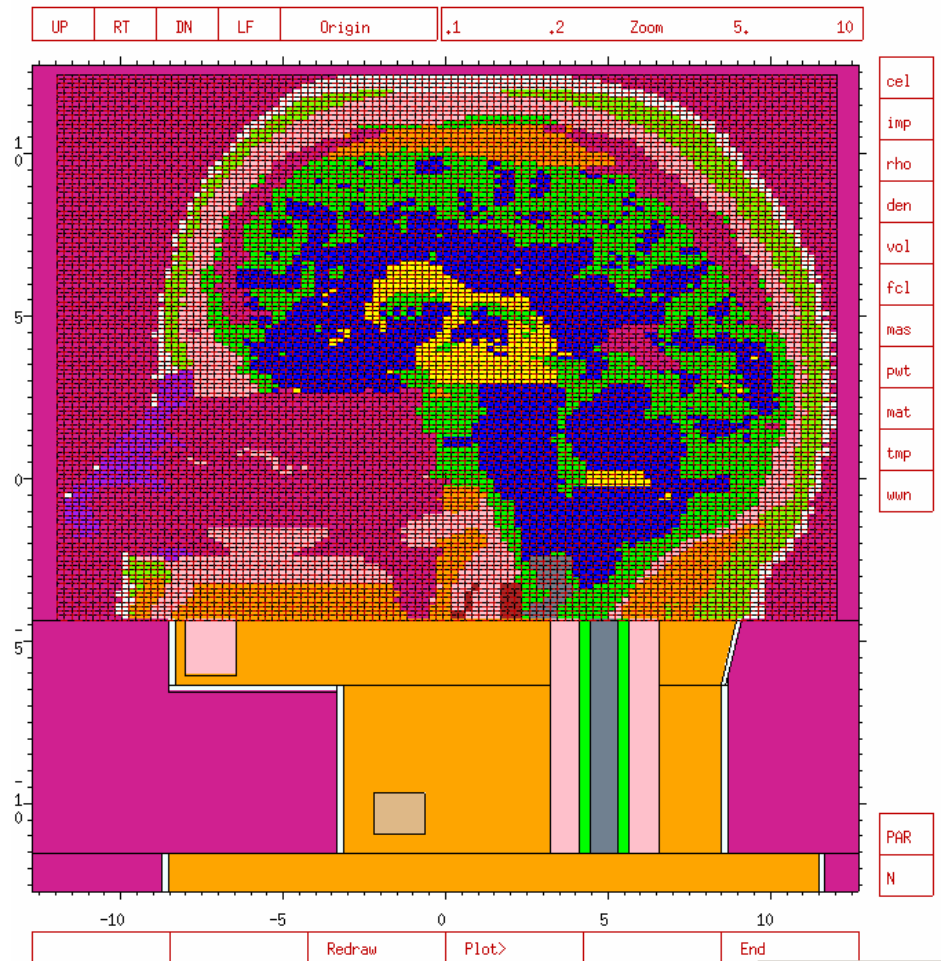
Bottle Phantom

- Markus Schlagbauer
- Austrian Research Centers
Seibersdorf
- Analytical Geometry
- Useful to compare to
direct measurements (if
you have the phantom)



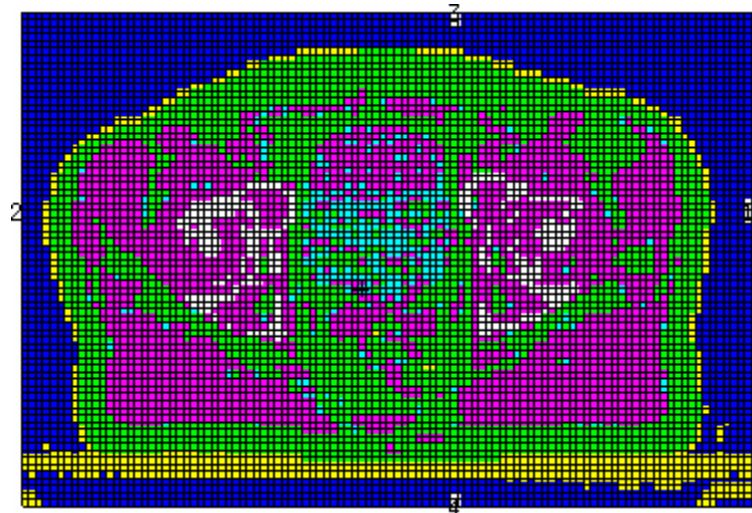
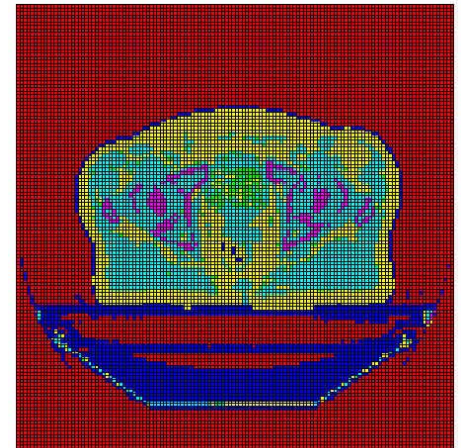
Zubal Phantom

- Voxel Phantom of Head
- 85 x 109 x 120 voxels
- 2.2 x 2.2 x 1.4 mm³
- 25 Brain structure tallies
- 15 materials
- Jeff Evans, Ohio State



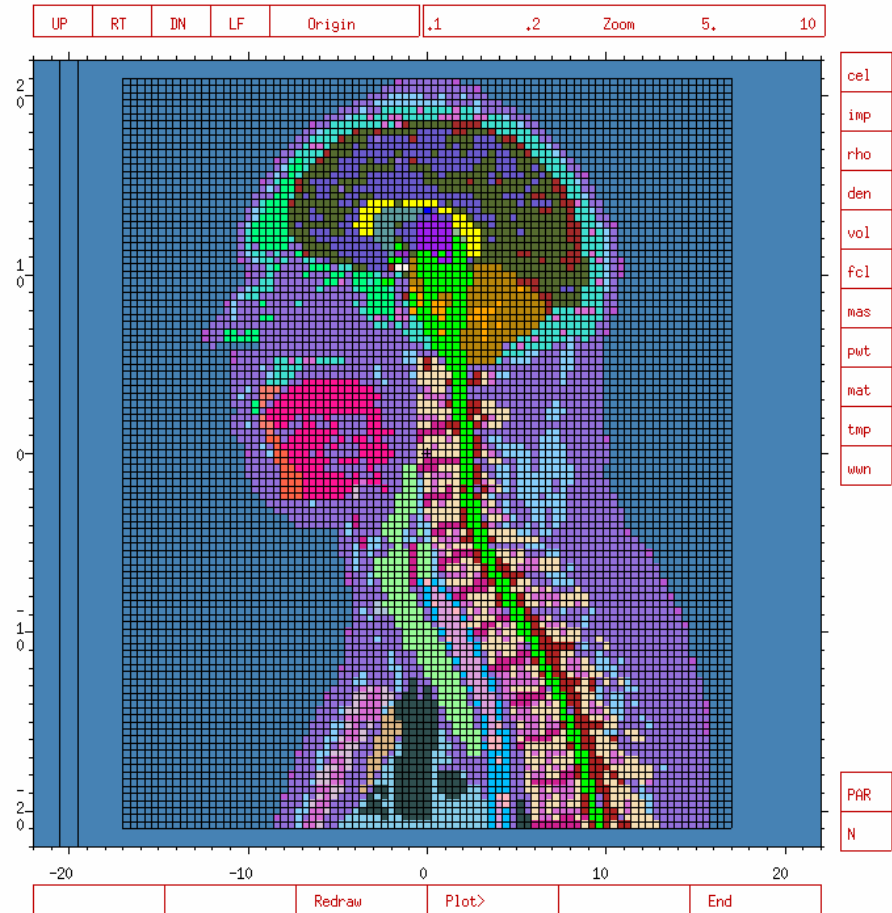
Male Pelvis Phantom

- Voxel Phantom of male pelvis
- 128 x 128 x 75 voxels
- 3.9 x 3.9 x 3.0 mm³
- 5 materials
- By Mark Wyatt
(wyattms@chartertn.net)
- Converted using
MCNPTV



VIP-Man

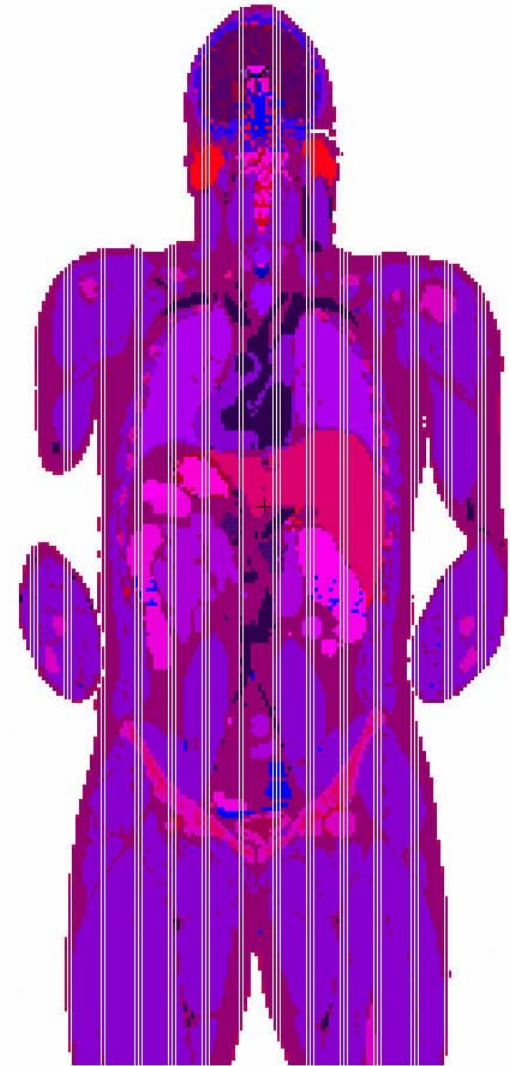
- Voxel Phantom of VIP-Man head and upper torso
- 147 x 86 x 105 voxels
- 2 x 2 x 2 mm
- 41 materials / organs
- By George Xu, RPI
(xug2@rpi.edu)



VIP Man

- Whole Body Phantom
- Based on NIH VIP-Man Project
- 6, 100, 300 Million Voxel Models
- 1 or 4 mm³
- Available from Prof. Xu of RPI – not in this database

http://www.rpi.edu/dept/radsafe/public_html/home.htm



QUADOS

- 5 Input decks submitted to the European MP code intercomparison (QUADOS) by MCNP team summer student Alex Redd.
<http://www.nea.fr/download/quados/quados.html>

