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LA-UR-04-8518 & LA-UR-05-6921

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Title: MCNP Medical Physics Geometry Database

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Chattanooga, TN, April 17-21, 2005

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Los Alamos
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MCNP Medical Physics Geometry Database – Input Decks

Abstract:

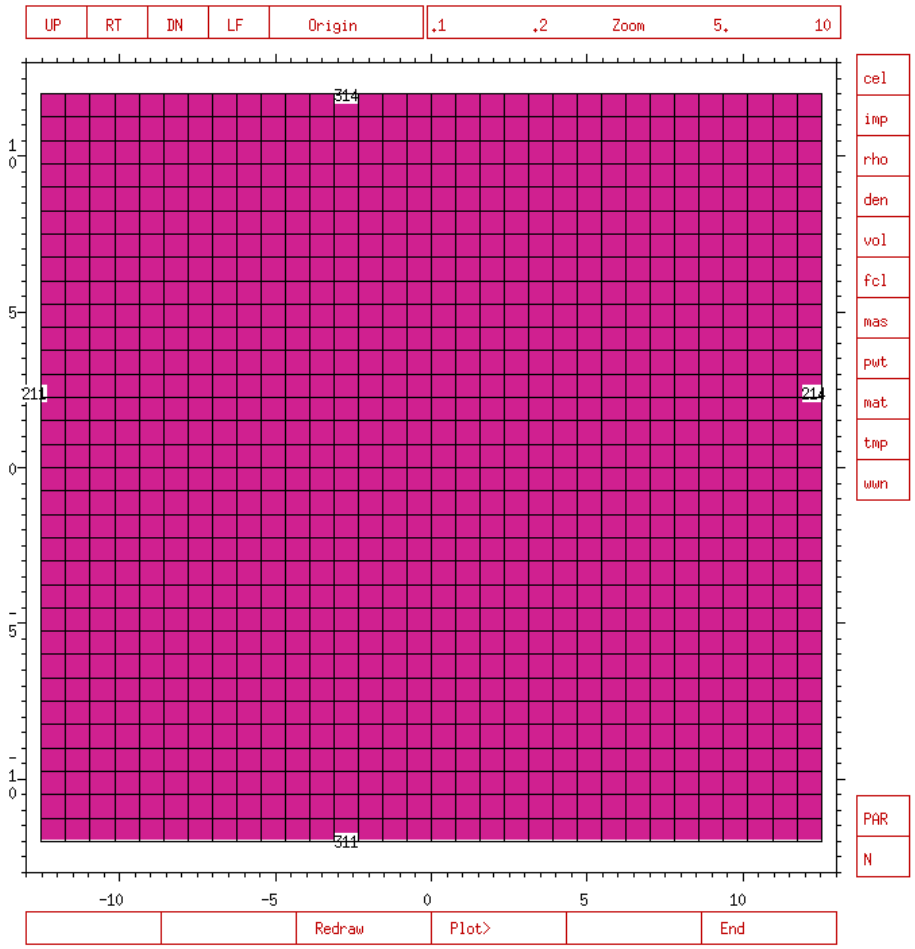
With the growing interest in using MCNP for medical physics calculations, demand has been increasing for geometric models which represent various portions of the human body. This database of analytical and voxelized (possibly based on CT data) geometries, in mcnp input deck form, would help to meet that 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-05-6921

Cubes

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

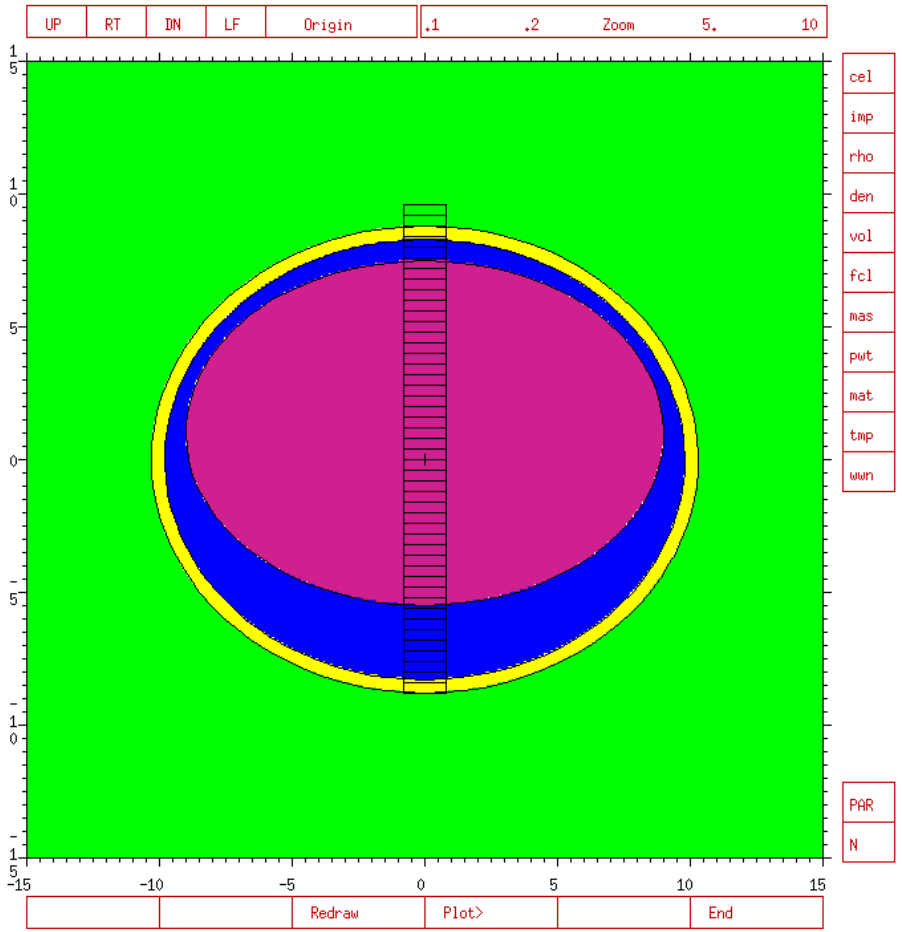
- Really only useful for code comparison or lattice construction



Snyder HP - Analytical

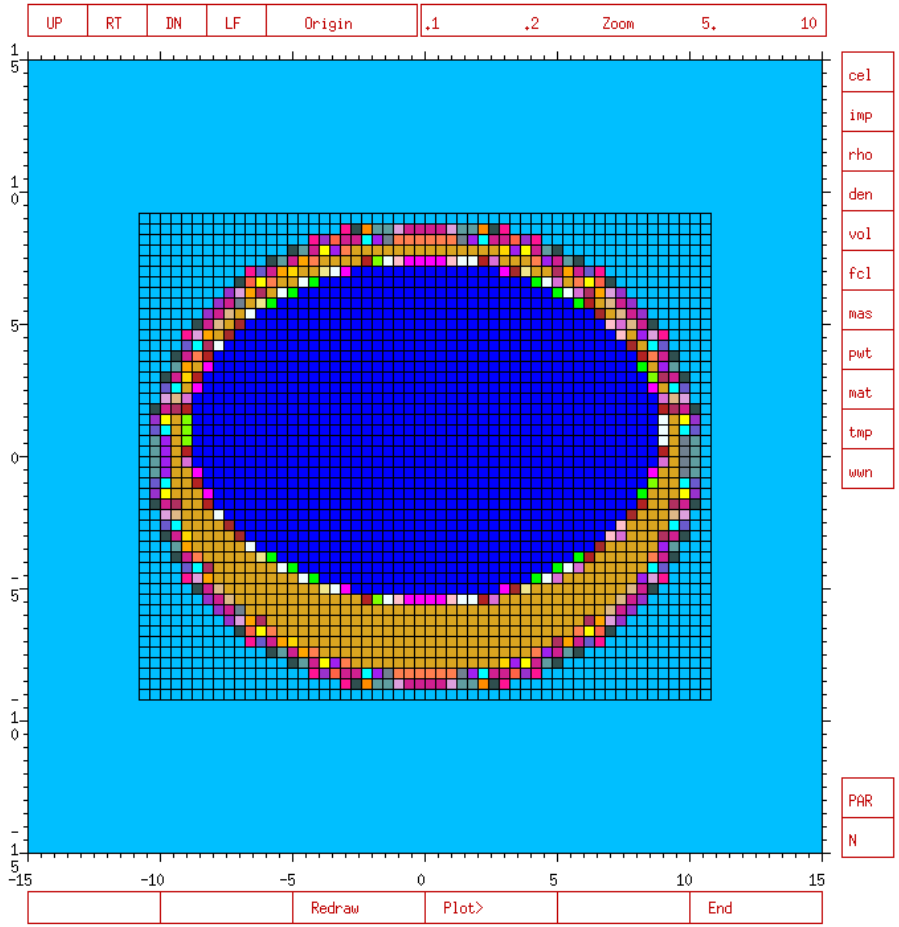
- Snyder head phantom w/ scalp
- Analytical geometry
- 3 materials
- Tallies along z-axis

- Also with explicit tumor



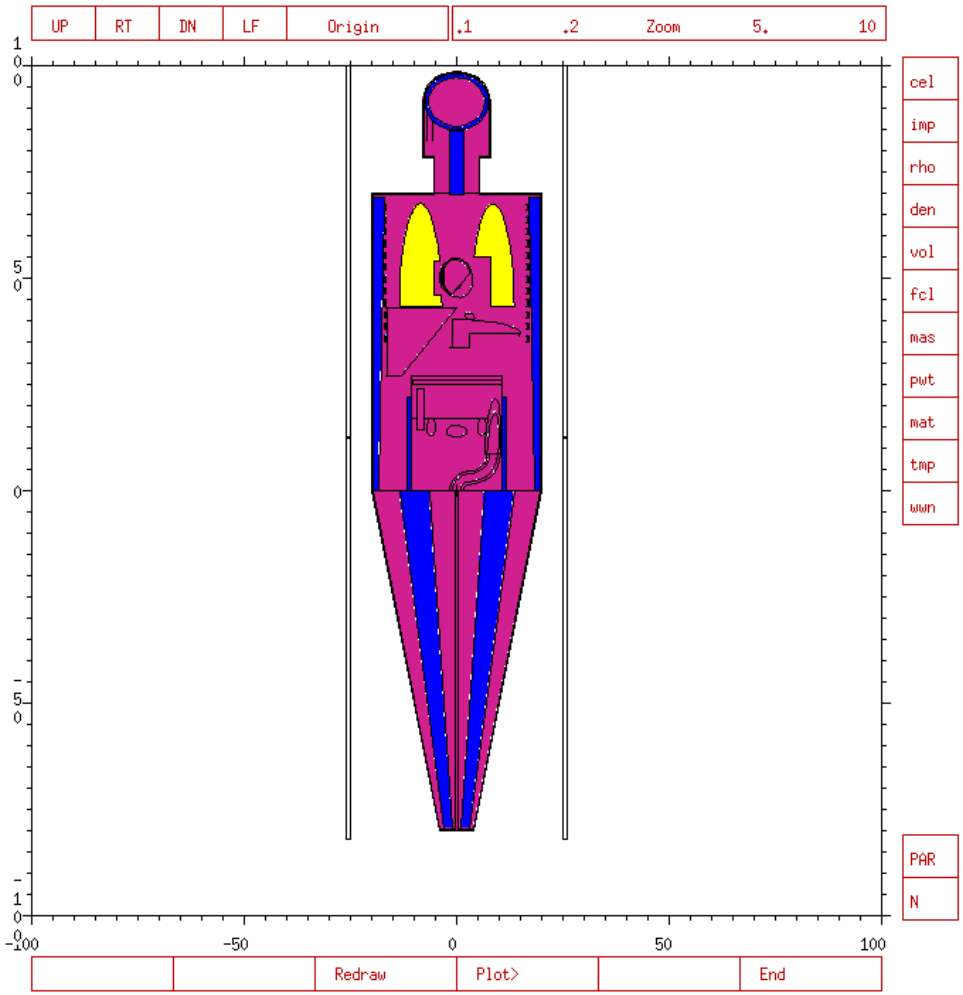
Snyder HP - Voxel

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



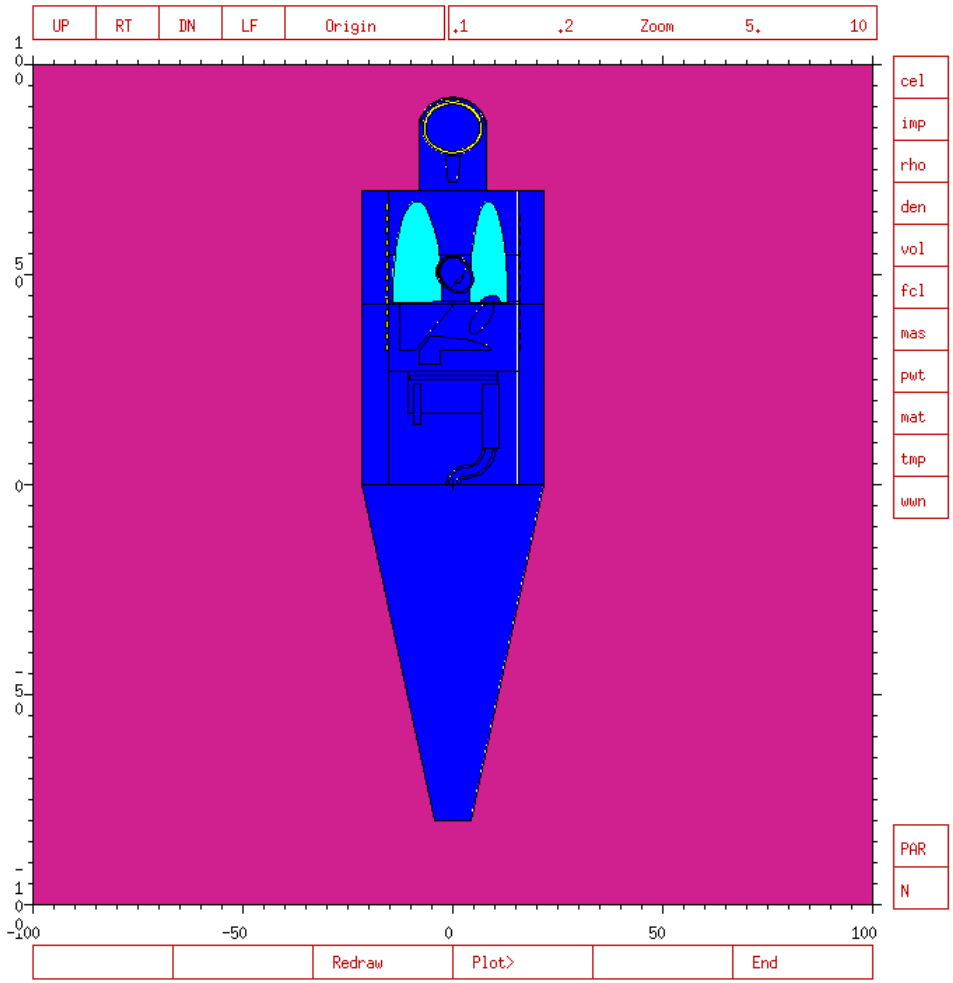
MIRD12 (ORNL)

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



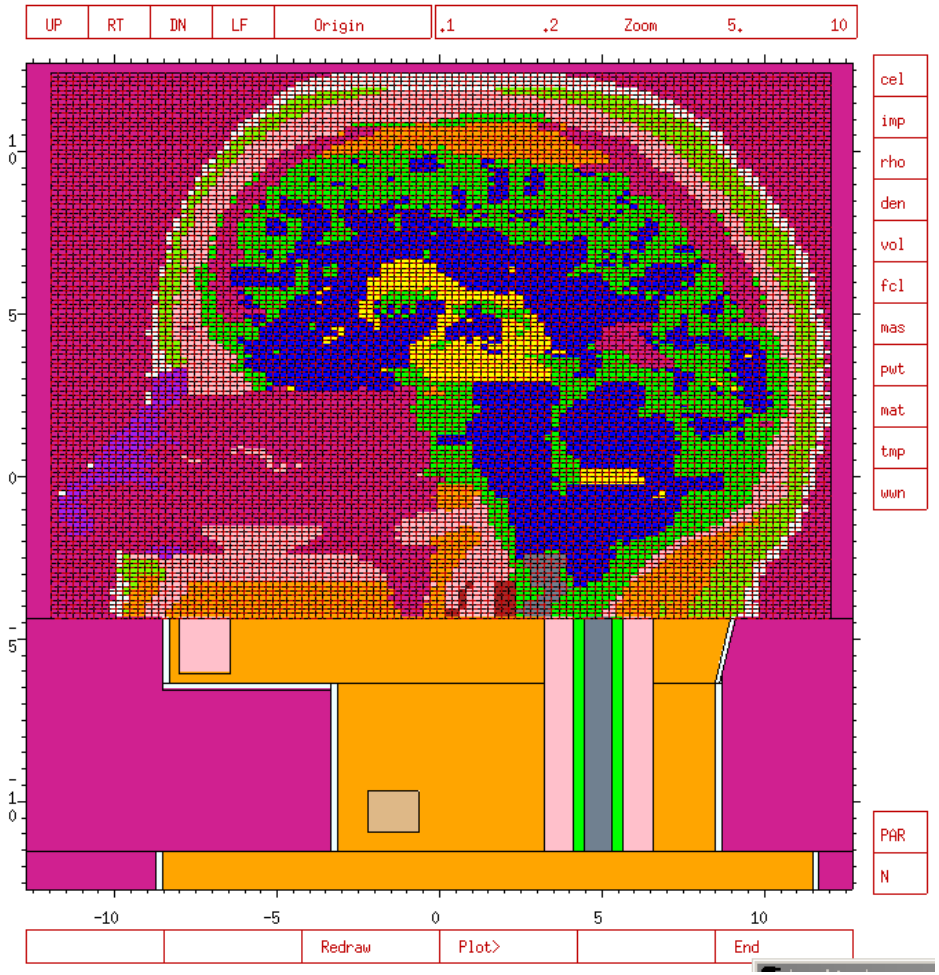
MIRD (Yanch)

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



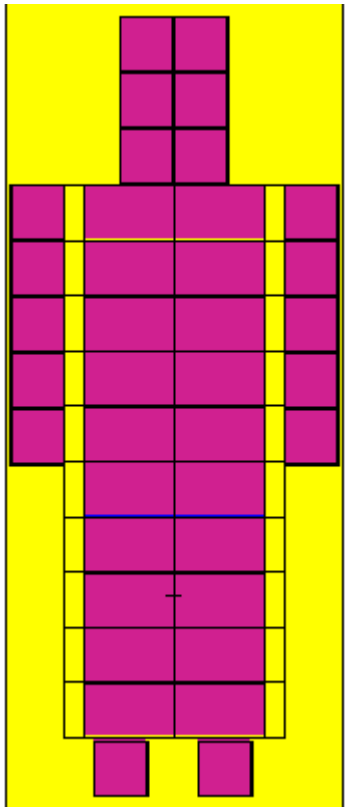
Zubal Phantom

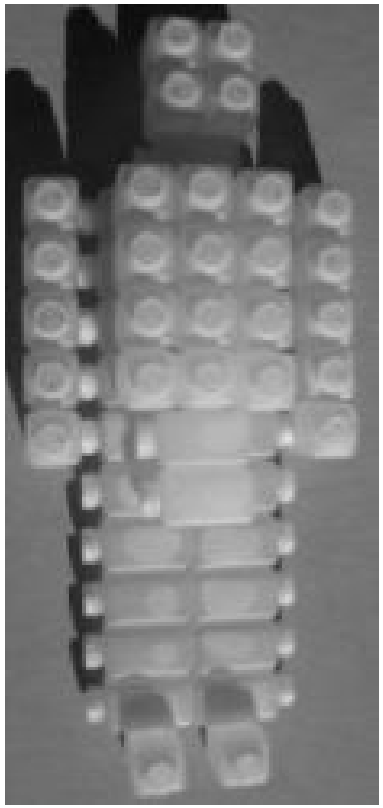
- Voxel Phantom of Head
- 85 x 109 x 120 voxels
- 2.2 x 2.2 x 1.4 mm^3
- 25 Brain structure tallies
- 15 materials
- Jeff Evans, Ohio State



Bottle Phantom

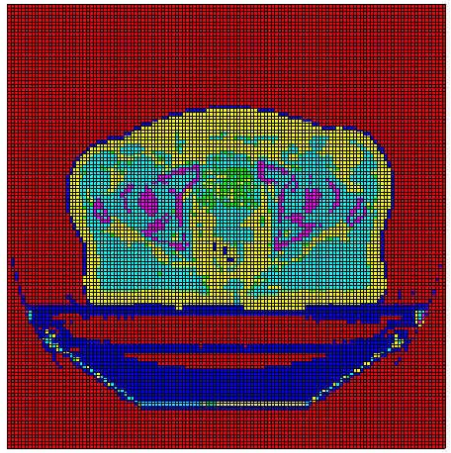
- Markus Schlagbauer
- Austrian Research Centers Seibersdorf
- Analytical Geometry
- Useful to compare to direct measurements (if you have the phantom)

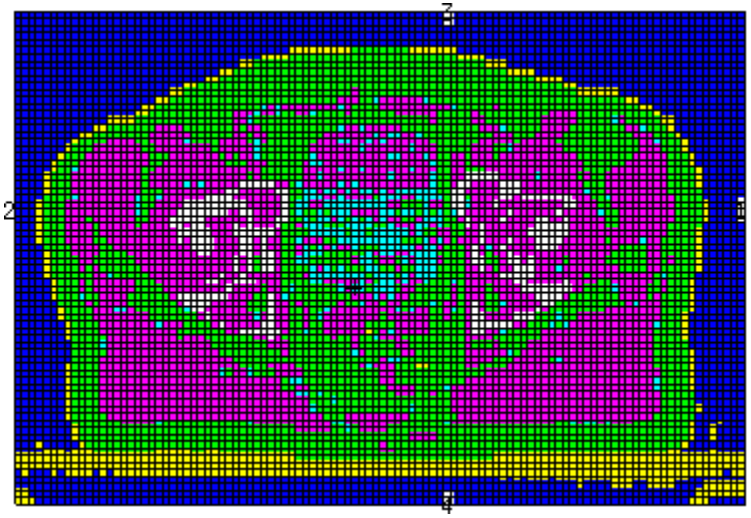




Male Pelvis Phantom

- Voxel Phantom of male pelvis
- 128 x 128 x 75 voxels
- 3.9 x 3.9 x 3.0 mm^3
- 5 materials
- By Mark Wyatt (wyattms@chartertn.net)
- Converted using MCNPTV





QUADOS

- 5 Input decks submitted to QUADOS by MCNP team summer student Alex Redd.