Cone Beam CT
Image Quality Testing

Corgi™ Phantom

With the automated Smári analysis, Corgi provides an efficient method to measure image quality and dose in cone beam CT systems.

phantomlab

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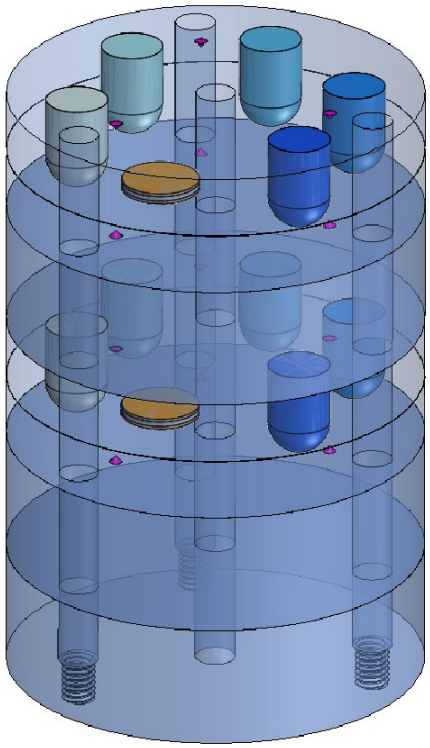
Corgi™ Phantom

Phantom Design

John Boone, Ph.D. and Jeffrey Siewerdsen, Ph.D. developed the original Corgi phantom design. They have collaborated with The Phantom Laboratory to develop the CGI014 production model of the Corgi™ phantom along with the automated analysis.

The modular phantom contains two image quality sections to better characterize the image quality and variation from measurements in both the center and edge of the cone beam. Because cone beam CT systems come in a variety of sizes, the 13.5cm diameter phantom can be configured in 12 and 20cm z axis lengths. Optional annuli can be used for additional attenuation.



Phantom Analysis

Image Quality

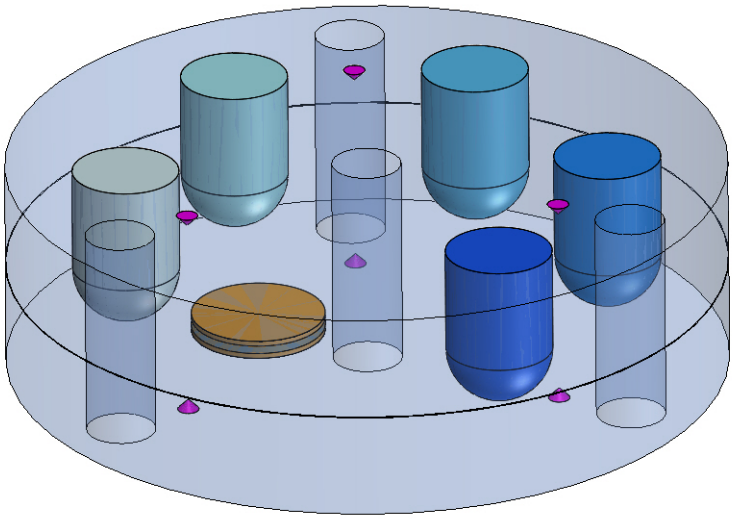
The image quality section is used to evaluate:

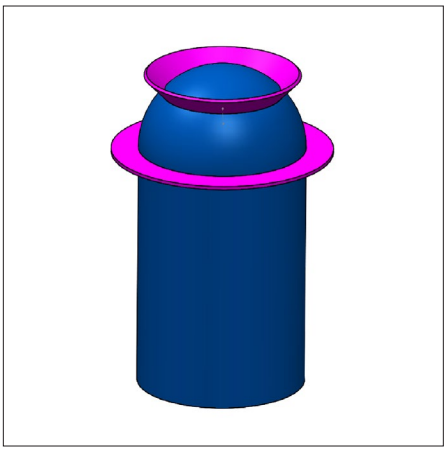
- Sensitometry
- High Resolution
  - Axial plane
  - Voxel resolution
- Cone beam artifact
- Distortion
  - Axial plane
  - Z direction

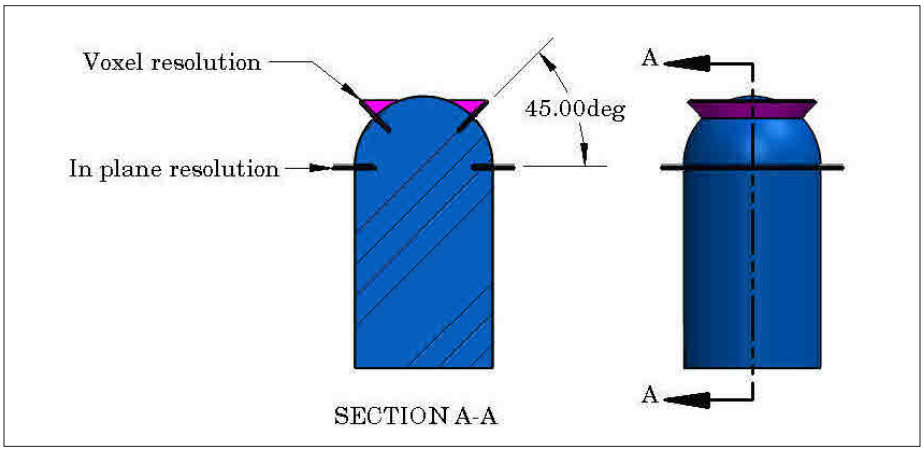
Sensitometry

The Corgi phantom contains 5 sensitometry inserts. The insert rods are 20mm in diameter with a semi-sphere at one end. They are made from Polystyrene, Nylon, Polycarbonate, POM Copolymer, and PVC.

High resolution measurements are calculated from the sensitometry rods using an edge spread function. Both in-plane and voxel resolution can be evaluated by running edges in the x-y plane or rotating the edge 45° to get x-y-z voxel resolution.

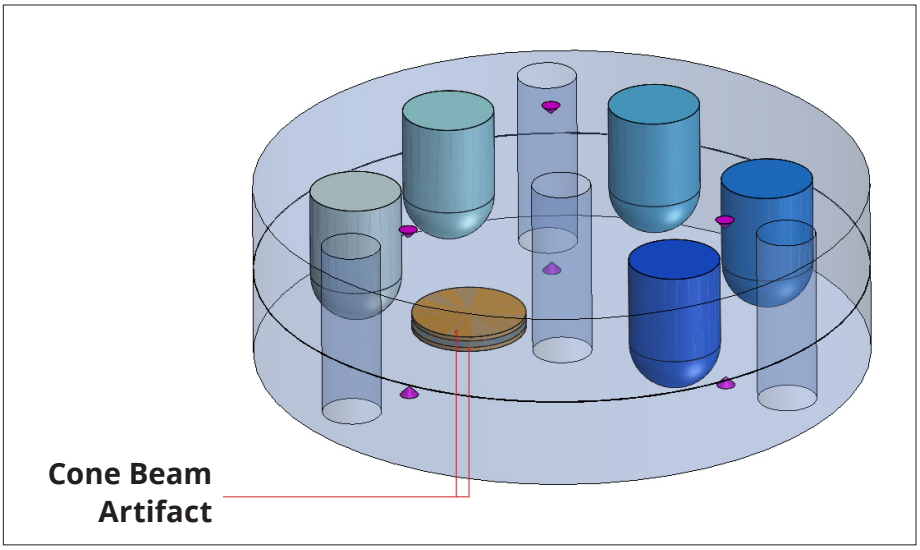


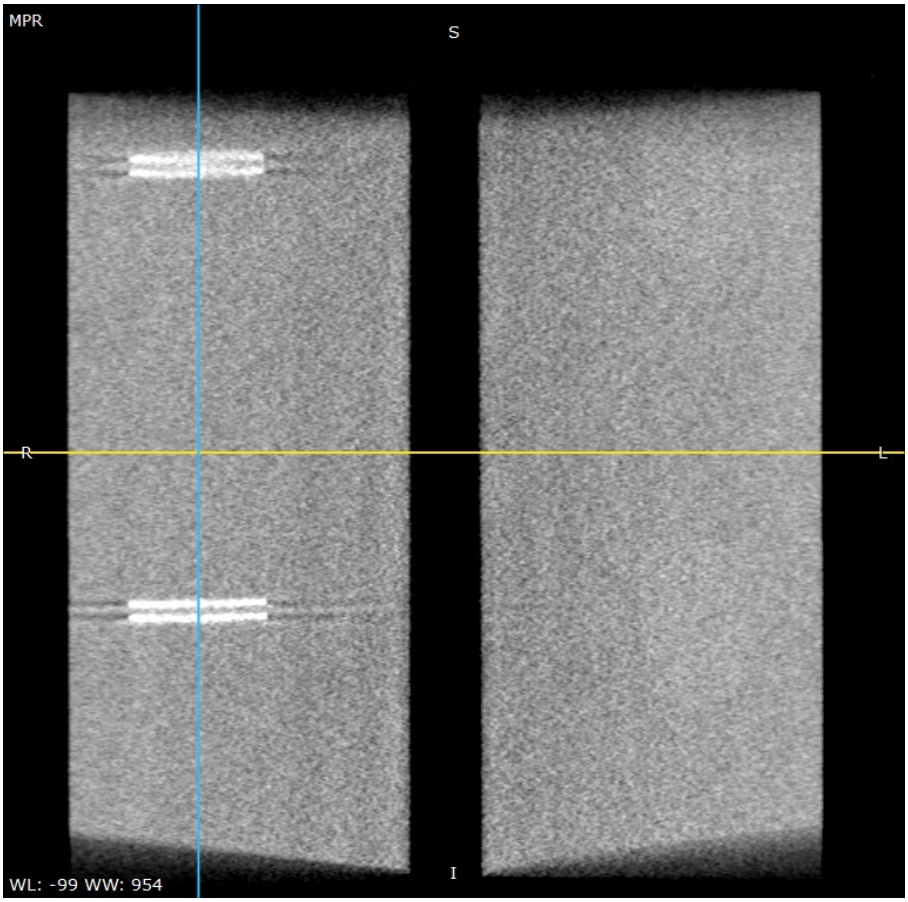




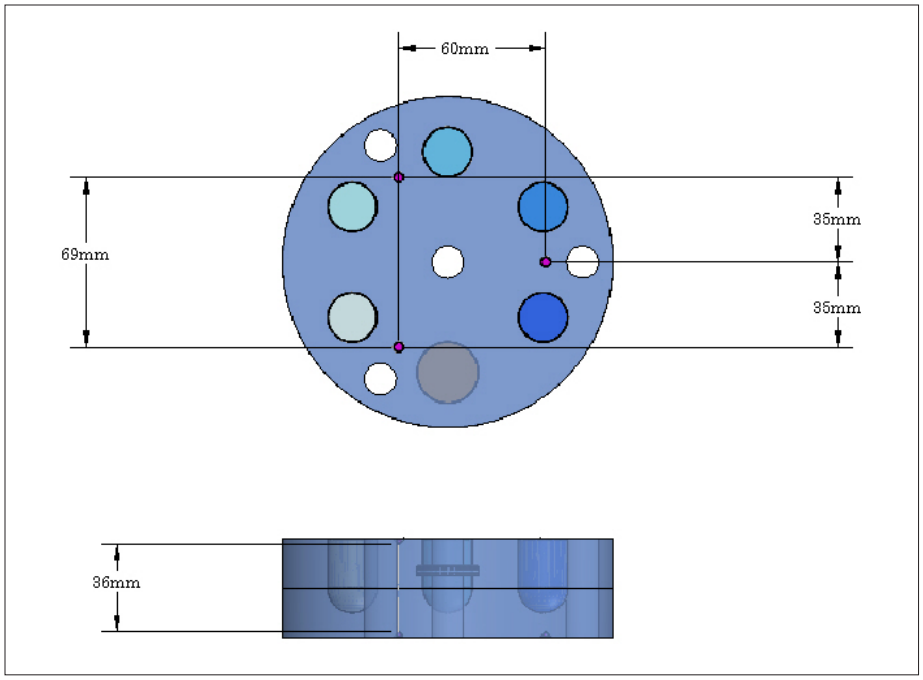
Teflon Disks

The cone beam artifact test is constructed from two Teflon disks, 25mm in diameter and 1mm thick. The disks are separated by 1.5mm. As the phantom is moved from a central to beam edge position, the beam divergence creates a z axis blurring of these objects which can be mathematically evaluated.

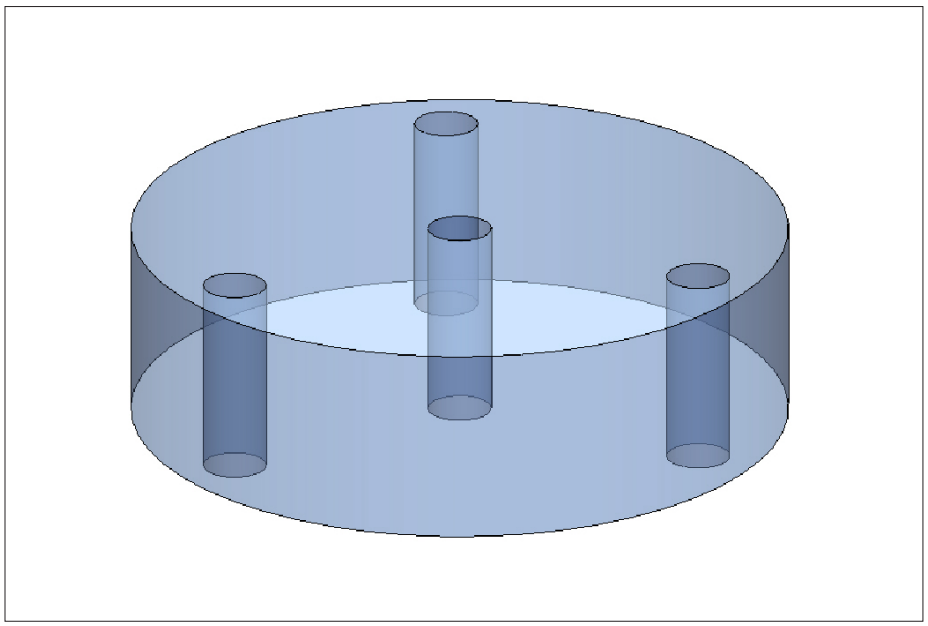




Phantom Analysis, continued



To measure x, y and z distortion 6 cone shaped voids are precisely machined on the top and bottom of the image quality module.



The phantom has 3 modules for measurement of image uniformity, noise, and dose. The central hole and 3 peripheral holes will accept a CTDI chamber. Connecting rods are easily removed enabling peripheral dose measurements in any of the locations.

Corgi™ Phantom Kit

The Corgi phantom comes complete with 5 modules 20 and 12cm configuration connecting rods, carrying case and includes 2 years of the Smári analysis service.

Smári Analysis Service

Smári

Complete Automation

Our Smari analysis platform removes the subjective human observer component from phantom image analysis, allowing the physicist to evaluate system performance and develop clinical imaging protocol procedures with objective data. The algorithms support clinically relevant protocols and the automated upload process, which does not require manual slice selection or identification of regions of interest, allows for frequent data collection. Numerical and graphical report output is displayed and can be customized to meet local, national, and international regulatory requirements. Smári maintains measurements for trend analysis, machine and protocol comparisons, and historical records.

For more information on the flexible Smári service, its database features and flexible report configurations is available at: www.phantomlab.com/smari-image-analysis

For more information on the Corgi™ Phantom, contact

The Phantom Laboratory:
email: info@phantomlab.com
phone: +1 518-692-1190

www..phantomlab.com/corgi