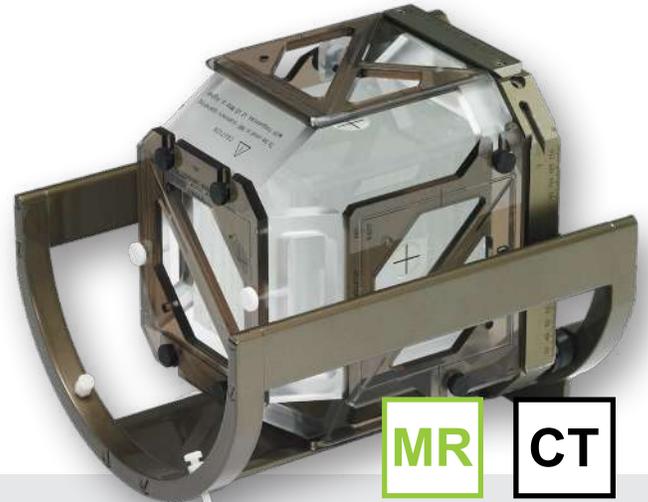


QUASAR^{GRID^{3D}}

BY MODUS QA

Designed for the Leksell Gamma Knife[®] Including
PERFEXION[™] and ICON[™] Systems

GRID^{3D} Image Distortion Analysis System



KEY FEATURES	BENEFITS
Compatibility:	Process images and assess distortion on MR and CT systems with or without a Leksell Gamma Knife [®] fiducial box. Ability to process co-registered datasets with increased support for ICON [™] CBCT analysis. Valuable for Geometric Distortion Analysis on all Leksell Gamma Knife [®] platforms.
High Resolution Accuracy:	Dense 1 cm ³ matrix of 1.5 mm signal generating channels create 2002 control points for geometric distortion analysis
Increased Confidence:	Option to assess Geometric Distortion within an imported GammaPlan [™] spatial reference frame
Workflow Efficiency:	Automated image analysis with advanced interface, visualization and reporting features.

The GRID^{3D} image distortion analysis system includes the high-resolution phantom and robust automated software platform. Together, they establish confidence that the imaging system supports the geometric accuracy and precision of the Leksell Gamma Knife[®].



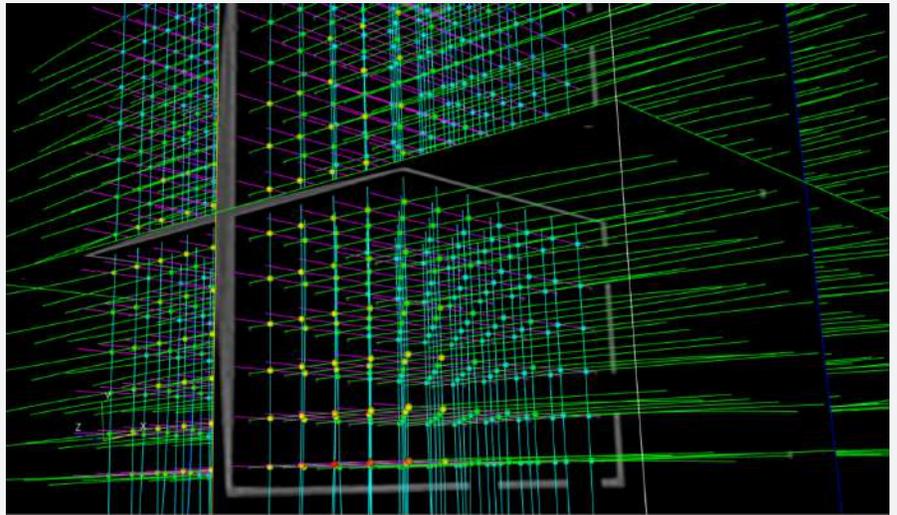
Above: The QUASAR GRID^{3D} acrylic cube containing a 1cm³ 3D grid of 1.5 mm channels filled with CuSO₄ solution.

GRID^{3D} is constructed of machined acrylic, designed to maintain geometric fidelity of the 1.5 mm channels. These interlinked channels are filled with MR and CT signal generating solution, creating 2002 control points in a 1 cm³ matrix. The control point positions are known within 0.1mm accuracy providing a stable baseline for analysis within the 11 cm x 13 cm x 14 cm cuboid.

The GRID^{3D} phantom is designed for easy attachment and compatibility with Leksell Gamma Knife[®] fiducial boxes and can also be used for frameless detection within the ICON[™] system.

ADVANCED CONTROL POINT DETECTION

GRID^{3D} uses an advanced control point detection algorithm using channel detection methods, resulting in a reduction of lost data points and improved detection accuracy. Algorithm is minimally affected by micro air pockets adjacent to control points.



"What I like about the QUASAR™ GRID^{3D} system is the simplicity of its design and operation. In a matter of minutes I can obtain a full 3D distribution of geometric distortion. Fine-tuning an MR sequence is now an efficient undertaking, as opposed to a nearly endless chore of phantom preparation and image analysis." - Ian Paddick, Consultant Physicist, Medical Physics Limited

GRID^{3D} Software Features

Easy to Read Data Evaluation Tools Improve Workflow and Analysis Efficiency



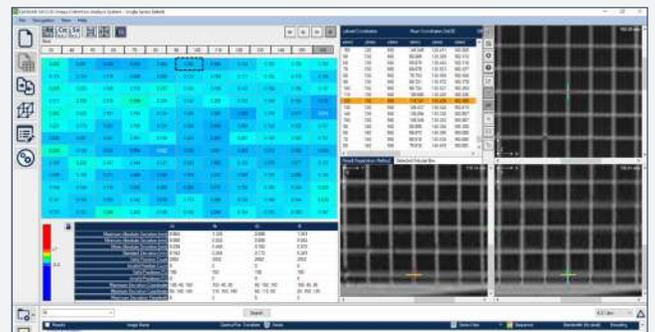
Single/Multi-Series evaluation tools include:

- ▶ Statistics summary table. Distortion reported as dx, dy, dz and dr (cumulative) deviations
- ▶ Phantom alignment (compared to DICOM origin)
- ▶ Charts including Histogram, Distortion Scatter Plot, and Cumulative percent below a given distortion
- ▶ Line plot of absolute distortion, Effect of Bandwidth on Distortion and Centroid tracking
- ▶ Report Generator produces PDF of analyzed data in an easy to interpret format including tables and graphs

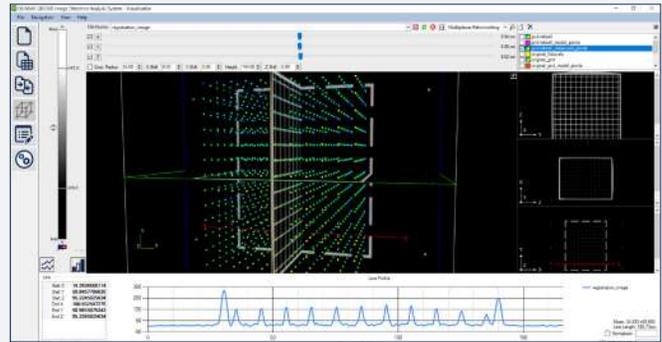
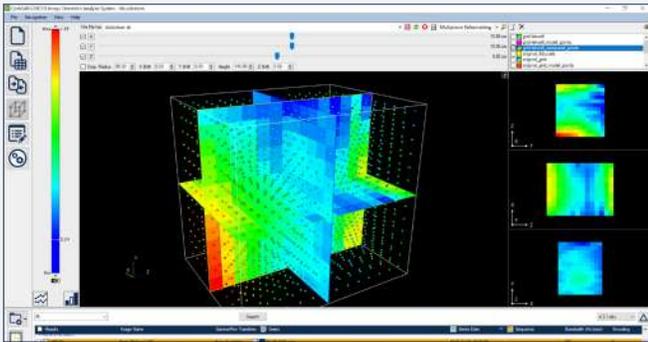
Individual Control Point Distortion and Detection Uncertainty Values Provide Transparent Data for an Informed Evaluation

Calculation and output of Geometric Distortion and detection uncertainty for each control point provides increased confidence in the understanding of a system's geometric distortion map.

Detected points can be manually tuned by the user for improved accuracy. Included ability to assess data within the GammaPlan™ frame of reference by importing associated (.ljp) file, increasing confidence in GRID^{3D} results.



Enhanced 3D Visualization Tools



Enhanced 3D visualization tools enable you to better understand the nature of your system's Geometric Distortion Vector Field.

- ▶ Customizable heat maps aid in visualizing distortion and uncertainty values in 3D
- ▶ Ability to generate line profiles and histograms from displayed image values
- ▶ Views include Window/Level control with Multiplanar Reformatting, ISO Surface Render, MIP and Density Sum profiles
- ▶ Options to display 3D representations of the measured vector field

SPECIFICATIONS

- ▶ GRID^{3D} phantom is constructed from rigid acrylic components, precisely machined to 0.1 mm specifications
- ▶ Phantom has 1.5mm CuSO₄-filled channels, producing MR and CT signal
- ▶ Imaging portion of the phantom is 11 cm (R/L) x 13 cm (A/P) x 14 cm (S/I)
- ▶ Overall dimensions are 18.5 cm x 22.3 cm x 19 cm
- ▶ Weight 4.5 kg

MINIMUM TECHNICAL REQUIREMENTS

- ▶ Windows 7 or higher (64-bit operating system)
- ▶ 4 gigabytes (GB) of RAM or more
- ▶ .NET Framework 4.6.1
- ▶ Visual C++ 2017 Runtime

ORDERING INFORMATION

100-1017

QUASAR™ GRID^{3D} Image Distortion Analysis System Includes:

- ▶ 1-Phantom
- ▶ 1-Software License*
- ▶ Storage Container
- ▶ User's guide

*Included Software License supports two (2) scanning systems.

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