MRI SCANNER PERFORMANCE EVALUATION

GREEN LIGHT IMAGING, LLC

Medical Mobile Diagnostics

8348 Rosemead Blvd

Pico Rivera, CA 90660

MRI Trailer

GE Genesis Signa Horizon LX 1.5T

S/N: R2947

Software Version: 12.0

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TEST RESULTS SUMMARY

MRI Performance Evaluation Test	PASS/FAIL/NA
1. Table Positioning & Setup Evaluation	PASS
2. Acquisition Console Check	PASS
3. Center Frequency Check	PASS
4. Transmitter Gain Consistency	PASS
5. Geometric Accuracy	PASS
6. High Contrast Spatial Resolution	PASS
7. Slice Thickness Accuracy	PASS
8. Slice Position Accuracy	PASS
9. Image Intensity Uniformity	PASS
10. Percent Signal Ghosting	PASS
11. Low Contrast Object Resolution Evaluation	PASS
12. Magnetic Field Homogeneity Evaluation	PASS
13. RF Coil Performance Evaluation	PASS
14. Soft Copy Display Evaluation	PASS
15. Site Technologist QC Program evaluation	PASS
16. Assessment of MRI Safety Program	PASS

PULSE SEQUENCE ACQUISITION PARAMETERS

ACR Sagital Localizer:
Spin Echo, TR 200, TE 20, NEX 1, FA 90, Slice Thickness 10 mm, 25 cm FOV
256x256 matrix, ± 15.63 kHz BW, 0:56 Scan Time, Scan Options: None

ACR Axial T1-weighted Scan:
Spin Echo, TR 500, TE 20, NEX 1, FA 90, Slice Thickness 5 mm Skip 5 mm, 25 cm FOV
256x256 matrix, ± 15.63 kHz BW, 2:16 Scan Time, Scan Options: None

ACR Axial T2-weighted Scan:
Spin Echo, TR 2000, TE 20/80, NEX 1, FA 90, Slice Thickness 5 mm Skip 5 mm, 25 cm FOV
256x256 matrix, ± 15.63/10.42 kHz BW, 8:56 Scan Time, Scan Options: None

Site T1-weighted Scan:
FSE-XL, TR 650, TE 8.5, ET 4, NEX 2, FA 90, Slice Thickness 5 mm Skip 5 mm, Phase FOV 0.9,
20x22 cm FOV, 224x320 matrix, ± 31.25 kHz BW, 1:10 Scan Time, Scan Options: FC, EDR, TRF,

Site T2-weighted Scan:
FSE-XL, TR 3400, TE 102, ET 23, NEX 2, Slice Thickness 5 mm Skip 5 mm, Phase FOV 0.9, 20x22 cm FOV, 224x320 matrix, ± 31.25 kHz BW, 1:15 Scan Time, Scan Options: FC, EDR, TRF, FAST, Z512, FR

RECOMMENDATIONS AND COMMENTS

* Above listed tests were performed in accordance with ACR MRI accreditation program guidelines, using the ACR MRI phantom and assorted manufacturer provided phantoms.

* Table positioning and acquisition console operation performance was found to be adequate.

* Slice positioning accuracy was found to be adequate, within 2 mm of the prescribed value. Slice thickness accuracy and contiguity were found to be within acceptable limits also.

* No significant image non-uniformities or distortions were noted in any of the axial, sagital and coronal planes.

* All tested coil signal to noise (SNR) measurements were found to be adequate, consistent with pulse sequence parameters and results from previous measurements.

* RF volume and surface coil performance evaluations were found to be adequate with no significant image non-uniformities and ghosting artifacts.

* Magnetic field homogeneity was evaluated using the bandwidth-difference method and was found to be adequate at less than 1 ppm over a 27 cm diameter of spherical volume.

* Technologists QC program is well established. Daily SNR measurements are properly performed and documented.

* Please note that the "HD T/R Knee Phased Array Coil" could not be tested and evaluated. An error message was generated every time we tried to pre-scan with the coil properly connected into Port A. Recommend service attention to verify integrity of the coil, Port A connections and pin contacts.

For further details about this performance evaluation please contact KJ Jerjian, Ph.D., at (949)683-5215, or by e-mail at kjmedicalphysics@gmail.com.

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1. TABLE POSITION & SETUP CHECK

This check is performed to determine that the MRI scanner is functioning properly during patient setup, data entry and pre-scan tasks.

Results:

a. Table docking, raising, lowering and positioning was verified to be functional and working properly.

b. Warning lights, indicator lights and emergency buttons all were functional and working properly.

c. Center of the sagital image of the phantom was within the recommended ± 2 mm of the central grid structure of the phantom.

2. ACQUISITION CONSOLE CHECK

This check is performed to determine that the MRI scanner acquisition console and workstation is functioning properly during patient setup, data entry and pre-scan tasks.

Results:

a. System shut down and startup functions execute properly.

b. The scanner interface, including mouse, keyboard and display were all functioning properly.

c. RIS and PACS system interface features were functional and system performance was found to be adequate.

3. CENTER FREQUENCY CHECK

This check is performed to determine that the MRI scanner is set on resonance for optimum system sensitivity and signal-to-noise ratio (SNR).

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: Automatic coil tuning & transmitter gain parameter adjustments

The ACR phantom was leveled and positioned in the head coil at the center of the magnet and automatic system adjustment (coil tuning) was performed for optimum system sensitivity and SNR. Coil tuning and transmitter attenuation and/or gain parameters were recorded for comparison purposes.

Results:
System determined RF center frequency was 63.860525 MHz, well within 2 ppm compared to results from last year..

Conclusion:
Coil tuning and transmitter gain parameters were found to be adequate, well within acceptable operating ranges. In general, weekly variations in the center frequency should not exceed ± 2.5 ppm (~ 150 Hz).

4. TRANSMITTER GAIN EVALUATION

This evaluation of fluctuations in the transmitter attenuation (or gain) in automatic pre-scan system adjustment and tuning mode is performed to assess problems in the radio frequency (RF) chain.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: Automatic coil tuning & transmitter gain parameter adjustments

The ACR phantom was leveled and positioned in the head coil at the center of the magnet and automatic system adjustment (coil tuning) was performed for optimum system sensitivity and SNR. Coil tuning and transmitter attenuation and/or gain parameters were recorded for comparison purposes.

Results:
The Transmitter Attenuation was determined to be 102 dB (ACR T1 Axial Mode).

Conclusion:
Coil tuning and transmitter gain parameters were found to be adequate, well within acceptable operating ranges.

5. GEOMETRIC ACCURACY

This test assesses the accuracy with which the MR image represents dimensional lengths of an object. A failure of this test means that there are significant distortions in the image and that measurements differ substantially more than it is expected from a properly functioning MR scanner.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Weighted Sequences

Geometric accuracy was tested in both axial and sagital planes to assess performance in all three orthogonal gradient directions. Horizontal and vertical distance measurements were made using the system distance measuring tool. The sagital localizer and axial slices #1 and #5 were used.

Results:
System measured dimensions of the phantom were compared to the actual phantom dimensions. The inside length and inside diameter of the phantom are 148 mm and 190 mm, respectively. Action limit is ± 2 mm.

	Horizontal Dimension	Vertical Dimension	Diagonal (+ 45º)	Diagonal (- 45º)	Maximum Deviation
Sagital Localizer					
Sag. Image #1	---	147 mm	---	---	- 1 mm
T1w Scan					
Axial Image #1	190 mm	190 mm	---	---	+ 0 mm
Axial Image #5	190 mm	190 mm	190 mm	190 mm	+ 0 mm
T2w Scan					
Axial Image #1	190 mm	190 mm	---	---	+ 0 mm
Axial Image #5	190 mm	190 mm	190 mm	190 mm	+ 0 mm

Conclusion:
Phantom dimension measurements were within the ACR recommended ± 2 mm limits. There are no significant geometric distortions in both the axial and sagital planes.

6. HIGH CONTRAST SPATIAL RESOLUTION

The high contrast spatial resolution test assesses the scanner's ability to resolve small objects when the contrast-to-noise ratio is sufficiently high that it does not play a role in limiting system spatial resolution ability.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Sequences and Site T1 and T2 Sequences

Images of the resolution insert in slice #1 containing three different arrays of holes with hole diameters measuring 1.1 mm, 1.0 mm and 0.9 mm were obtained using a 5 mm slice thickness. The smallest size holes resolved under optimal viewing conditions in both the frequency and phase encoding directions was determined.

Results:

	Frequency Encoding Direction	Phase Encoding Direction
ACR T1 Weighted Sequence	1.0 mm	1.0 mm
ACR T2 Weighted Sequence	1.0 mm	1.0 mm
Site T1 Weighted Sequence	0.9 mm	0.9 mm
Site T2 Weighted Sequence	0.9 mm	0.9 mm

Conclusion:
The field of view and matrix size for the axial ACR series are chosen to yield a resolution of close to 1.0 mm in both directions. The smallest size holes resolved in both the frequency and phase encoding directions were determined to be consistent with pulse sequence parameters. Factors contributing to high-contrast resolution include field-of-view (determined by gradient strength and sampling period), acquisition matrix and reconstruction filters.

7. SLICE THICKNESS ACCURACY

The slice thickness accuracy test assesses the accuracy with which a slice of a specified thickness is actually achieved.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Sequences and Site T1 and T2 Sequences

T1 and T2 weighted images of the “slice thickness insert” in slice #1 were obtained using 5 mm slice thicknesses. Following the adjustment of the window/level setting to about one full-width-half-max (FWHM) of the signal producing ramps, the top and bottom signal ramps were measured. The slice thickness was computed using the following equation, where the factor 0.1 is used to account for the slope of the ramps.

Slice Thickness = 0.1 * (2 * Top Ramp * Bottom Ramp)/(Top Ramp + Bottom Ramp)

Results:
The slice thickness evaluation insert was measured with a narrow window width and a window level setting of about one FWHM.

	Top Ramp	Bottom Ramp	Slice Thickness
ACR T1 Weighted Sequence	55 mm	51 mm	5.3 mm
ACR T2 Weighted Sequence	56 mm	51 mm	5.3 mm
Site T1 Weighted Sequence	56 mm	51 mm	5.3 mm
Site T2 Weighted Sequence	55 mm	51 mm	5.3 mm

Conclusion:
Slice thickness accuracy was found to be adequate. For a nominal slice thickness of 5 mm, the measured value should be in the range of 5.0 ± 0.7 mm. Factors that could adversely affect the slice thickness accuracy include the gradient field and rf field uniformity, non-uniform static field, non-coplanar slice selection pulses between excitation and readout, TR/T1 ratio, and rf pulse shape and stimulated echoes.

8. SLICE POSITION ACCURACY

The slice position accuracy test assesses the accuracy with which slices can be prescribed at specific locations utilizing the graphical localizer image for positional reference.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 Weighted Sequence

Multi-slice T1 weighted images were obtained using the ACR T1 weighted protocol with a slice thickness of 5 mm and a gap of 5 mm. In axial slices #1 and #11, the crossed wedges appear as a pair of adjacent, dark, vertical bars at the top of the phantom. The bar length differences at prescribed locations were measured. Note that a bar length difference of zero indicates a slice position accuracy that is perfectly aligned with the vertex of the crossed wedges, and that by design of the wedges, the bar length difference is twice the actual slice displacement error.

Results:
Slice position accuracy was evaluated using the paired crossed wedges of the ACR MRI phantom.

	ACR T1 Axial Image #1	ACR T1 Axial Image #11
Expected Bar Length Difference	0.0 mm	0.0 mm
Measured Bar Length Difference	-2.0 mm	0.0 mm
Actual Slice Displacement Error	-1.0 mm	0.0 mm

	ACR T2 Axial Image #1	ACR T2 Axial Image #11
Expected Bar Length Difference	0.0 mm	0.0 mm
Measured Bar Length Difference	-2.0 mm	0.0 mm
Actual Slice Displacement Error	-1.0 mm	0.0 mm

Results indicate a slice position accuracy of better than 1.0 mm and inter-slice gap accuracy of better than 1.0 mm over a range of 10 cm, corresponding to 11 slices and 10 inter-slice gaps.

Conclusion:
Slice position accuracy was found to be adequate. The magnitude of each bar length difference should be less than or equal to 5 mm corresponding to a slice positioning accuracy of 2.5 mm or better. Factors that could adversely affect the slice thickness accuracy include the gradient field and rf field uniformity, non-uniform static field, non-coplanar slice selection pulses between excitation and readout, TR/T1 ratio, and rf pulse shape and stimulated echoes.

9. IMAGE INTENSITY UNIFORMITY

The image uniformity test measures the uniformity of the image signal near the middle of the coil.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Sequences and Site T1 and T2 Sequences

Non-interleaved, multi-slice images of the flood section of the ACR MRI phantom were obtained using a 5 mm slice thicknesses with a skip of 5 mm. A region approximately equal to 75% of the image is evaluated to determine maximum (Smax) and minimum (Smin) signal values. The percent integral uniformity (PIU) is evaluated using the following formula:

$$U = 100 * [\ 1 \ - \ (Smax - Smin)/(Smax+Smin)\ ]$$

Results:
Note: Using the above formula a value of 100% represents perfect integral uniformity.

	Maximum Signal Smax	Minimum Signal Smin	Percent Image Uniformity
ACR T1 Weighted Sequence	1309	1227	97%
ACR T2 Weighted Sequence	901	840	96%
Site T1 Weighted Sequence	1504	1408	97%
Site T2 Weighted Sequence	761	709	96%

Conclusion:
System image uniformity was found to be adequate using the Site T1 and T2 protocols. Percent integral uniformity should be better than 87.5% for systems with field strengths less than 3T, and better than 82% for 3T magnets. Parameters contributing to image non-uniformity include static field in-homogeneity, rf-field non-uniformity, eddy currents, gradient pulse calibration, and image processing. It should be noted that with larger field-of-views, image uniformity may further deteriorate.

10. PERCENT SIGNAL GHOSTING

The percent signal ghosting test assesses the level of ghosting artifacts (a faint copy of the imaged object displaced and superimposed on the image).

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Sequences and Site T1 and T2 Sequences

Multi-slice T1 and T2 weighted images of the signal producing region were obtained and the ghosting ratios quantified using ROI measurements in and around the signal producing region in image #7.

Signal ghosting as a fraction of the primary signal is calculated using the following formula:

$$\text{Ghosting Ratio} = |(\text{Ghost Signal}) - (\text{Background Signal})| / (2 * \text{Large ROI Signal})$$

Where the ghost signal and background signal are the mean ROI signals in the non-signal producing areas around the phantom in the phase encoding and frequency encoding directions, respectively, and the Large ROI is the mean signal intensity in the middle of signal producing region of the phantom.

Results:

	Top ROI	Bottom ROI	Left ROI	Right ROI	Large ROI	Ghosting Ratio
ACR T1 Weighted Sequence	9	9	10	10	1274	0.000
ACR T2 Weighted Sequence	9	9	13	11	872	0.003
Site T1 Weighted Sequence	17	16	21	21	1474	0.003
Site T2 Weighted Sequence	16	16	19	19	740	0.004

Conclusion:
Signal ghosting ratio was found to be adequate. The value for ghosting as a fraction of the primary signal should be less than or equal to 0.025. No obvious smears, ghost images or quadrature errors were apparent in the images. Factors affecting phase related artifacts and ghosting errors include phase encoding gradient instabilities, quadrature maladjustment in synthesis of slice selective rf pulses (transmit errors), and improper quadrature phase decoding on receive.

11. LOW CONTRAST OBJECT RESOLUTION

The low contrast object resolution evaluation assesses the extent to which objects of low contrast are discernible in the images.

Phantom: ACR MRI Accreditation Phantom
RF Coil: Standard GE Head Coil
Test Protocol: ACR T1 and T2 Sequences and Site T1 and T2 Sequences

Multi-slice T1 and T2 weighted images of the four low contrast disk inserts of the ACR MRI phantom were obtained using a 5 mm skip 5 mm slice thickness. The four low contrast resolution disks of varying thickness provide contrast levels of 1.4%, 2.5%, 3.6% and 5.1%, respectively. Each disk has 10 sets of holes varying in size from 7.0 mm to 1.5 mm, progressively. The number of complete sets that are resolved in each disk is added for a cumulative total low contrast resolution score.

Results:
The following table summarizes the number of sets of holes (spokes) visible in each of the images and the corresponding total score.

	Disk 1 Image #11	Disk 2 Image #10	Disk 3 Image #9	Disk 4 Image #8	Total Score
ACR T1 Weighted Sequence	10	10	10	10	40
ACR T2 Weighted Sequence	10	10	10	7	37
Site T1 Weighted Sequence	10	10	10	6	36
Site T2 Weighted Sequence	10	10	7	5	32

Conclusion:
The low contrast resolution was found to be adequate. The total number of sets of holes that are resolved using ACR sequences should be at least 9 for systems with field strengths less than 3T, and at least 37 spokes for MRI systems with field strengths of 3T. Low contrast resolution is affected by signal-to-noise ratio (SNR) and phantom insert alignment. Factors affecting signal-to-noise ratio include general system calibration (resonance frequency, flip angles, etc.) gain, coil tuning, rf shielding, coil loading, image processing and scan parameters. Note that when slices are not perfectly centered on the low contrast disks, partial volume effects could influence these qualitative measurements.

12. MAGNETIC FIELD HOMOGENEITY EVALUATION

The Bandwidth-difference method[1] (ΔBD) was used to evaluate the magnetic field homogeneity (MFH). This method compares the image distortion using small and large bandwidth acquisitions to determine MFH.

Phantom: 27 cm Diameter GE Spherical Phantom
RF Coil: Integrated GE Body Coil
Test Protocol: GRE Sequence, TR 50 msec, TE 10 msec, FA 25 degrees, 40 cm FOV, 256x256 Matrix, 1 Slice, Thickness 5 mm, NEX 1, BW1 ± 2.00 kHz, BW2 ± 31.25 kHz.

Images in all three planes were obtained using Gradient Echo (GRE) sequences with two different bandwidths. Spherical volume diameters were measured in the frequency encoding direction. Magnetic field homogeneity was calculated in parts per million (ppm) using the following equation:

$$\text{Homogeneity (ppm)} = [BW1 * BW2 *(x1 - x2)] / [CF*FOV*(BW2 - BW1)]$$

where, BW1 and BW2 are the two different bandwidths in Hz, x1 and x2 are the corresponding spherical volume diameter measurements in mm in the frequency encoding direction, FOV is the image field-of-view in mm, and CF is the resonant Center Frequency in MHz.

Results:

Frequency:		63.860582	MHz
Bandwidth 1:	± 2.00 kHz	4160	Hz
Bandwidth 2:	± 31.25 kHz	62500	Hz

	Spherical Volume Diameter w/ BW1	Spherical Volume Diameter w/ BW2	Magnetic Field Homogeneity
Axial Plane (27 cm DSV)	269.0 mm	266.0 mm	0.5 ppm
Coronal Plane (27 cm DSV)	261.0 mm	262.0 mm	0.2 ppm
Sagital Plane (27 cm DSV)	262.0 mm	266.0 mm	0.7 ppm

Conclusion:
Magnetic field homogeneity was found to be adequate at less than 1 ppm over a diameter of spherical volume of 27 cm.

[1] *Chen et al., "Routine Testing of Magnetic Field Homogeneity on Clinical MRI systems", Med. Phys. 33, 4299-4306, (2006).*

13. RF COIL PERFORMANCE EVALUATION

RF coil performance was evaluated using manufacturer provided phantoms of appropriate size and shape using a T1 weighted protocol:

RF Coil 1: Standard GE Head Coil
Phantom: 17 cm GE Spherical Phantom w/ Loader

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 113 dB.

Results: Axial Orientation

RF Coil 2021 Test Results	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
Standard GE Head Coil	981	1020	933	9.4	4.7	10.4

RF Coil 2021 Test Results	SNR	Percent Image Uniformity	Percent Signal Ghosting
Standard GE Head Coil	209	96%	0.1%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images.
SNR and image uniformity were found to be adequate.

RF Coil 2: 8 Ch High Res Brain Array by MRI Devices
Phantom: 17 cm GE Spherical Phantom w/o Loader

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 118 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
8 Ch High Res Brain Array by MRI Device	1222	1596	1008	14.1	2.4	15.7

RF Coil	SNR	Percent Image Uniformity	Percent Signal Ghosting
8 Ch High Res Brain Array by MRI Device	509	77%	0.1%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images.
SNR and image uniformity were found to be adequate.

13. RF COIL PERFORMANCE EVALUATION (Continued)

RF coil performance was evaluated using manufacturer provided phantoms of appropriate size and shape using a T1 weighted protocol:

RF Coil 3: Integrated Body Coil
Phantom: 27 cm GE Spherical Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 36 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 118 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
Integrated Body Coil	942	997	880	17.4	8.3	20.6

RF Coil	SNR	Percent Image Uniformity	Percent Signal Ghosting
Integrated Body Coil	114	94%	0.2%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. SNR value with the standard GE phantom was found to be consistent with results from previous evaluations. Image uniformity was also found to be adequate.

RF Coil 4: 8 Ch Body Array by GE Full FOV
Phantom: CTL Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 32 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 136 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
8 Ch Body Array by GE Full FOV	---	1926	---	19.0	3.5	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
8 Ch Body Array by GE Full FOV	550	n/a	n/a

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. Image uniformity distribution and Maximum SNR values were found to be adequate.

13. RF COIL PERFORMANCE EVALUATION (Continued)

RF Coil 5: QUADKNEE T/R Knee-Foot Coil
Phantom: 12 cm Diameter Knee Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 95 dB.

Results: Sagital Orientation chk uniformity and all!!!

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
QUADKNEE T/R Knee-Foot Coil	---	2167	---	7.9	4.0	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
QUADKNEE T/R Knee-Foot Coil	536	n/a	n/a

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. Image uniformity distribution and Maximum SNR values were found to be adequate.

RF Coil 6: HD TRknee PA
Phantom: 12 cm Diameter Knee Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 106 dB.

Results: Could not pre-scan.

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
HD TRknee PA	---	N/A	---	N/A	N/A	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
HD TRknee PA	#VALUE!	n/a	n/a

Conclusion:
Please note that the "HD T/R Knee Phased Array Coil" could not be tested and evaluated. An error message was generated every time we tried to pre-scan with the coil properly connected into Port A. Recommend service attention to verify integrity of the coil, Port A connections and pin contacts.

13. RF COIL PERFORMANCE EVALUATION (Continued)

RF Coil 7: GPFLEX Single Channel Surface Coil]
Phantom: 12 cm Diameter Bottle

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 125 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
GPFLEX Single Channel Surface Coil]	---	1632	---	5.6	2.5	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
GPFLEX Single Channel Surface Coil]	653	n/a	n/a

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. Image uniformity distribution and Maximum SNR values were found to be adequate.

RF Coil 8: SHLDRPA4 Large Shoulder Coil
Phantom: GE 17 cm Diameter Spherical Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 18 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 127 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
SHLDRPA4 Large Shoulder Coil	---	6501	---	36.6	8.4	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
SHLDRPA4 Large Shoulder Coil	771	n/a	n/a

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. Image uniformity distribution and Maximum SNR values were found to be adequate.

13. RF COIL PERFORMANCE EVALUATION (Continued)

RF coil performance was evaluated using manufacturer provided phantoms of appropriate size and shape using a T1 weighted protocol:

RF Coil 9: 8Ch CTL Spine Array Coil CTL123
Phantom: GE CTL Phantom

Pulse Sequence:
Spin Echo, TR 300, TE 20, 1 NEX, FA 90, 5 x 5 mm Slice Thickness, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 123, 124 and 132 dB, respectively.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
8Ch CTL Spine Array Coil CTL123	---	2500	---	25	5.6	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
8Ch CTL Spine Array Coil CTL123	446	n/a	n/a

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
CTL234	---	2909	---	25	5.7	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
CTL234	510	n/a	n/a

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
CTL456	---	2881	---	22	4.5	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
CTL456	640	n/a	n/a

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images. Image uniformity distribution and Maximum SNR values were found to be adequate.

14. SOFT COPY DISPLAY EVALUATION

Luminance Meter Make/Model: RaySafe X2 Light Sensor/Photometer

Soft Copy SMPTE Pattern Evaluation:

1. The 5% and the 95% square contrast patterns were properly resolved and visualized.
2. Each gray-level step from 0% to 100% was uniform and distinct from the adjacent step.
3. The borders and lines of the SMPTE pattern were straight.
4. No spatial distortions or misalignments were noted in the grids across the screen.
5. Alphanumeric characters looked sharp and focused.
6. The high contrast line-pair resolution patterns in the center and corners of the display area were linear, properly resolved and adequately visualized without any magnification.
7. No streaking was noted in and around the white and black rectangular patterns.

The overall appearance of the SMPTE pattern was found to be adequate. The soft copy display monitor resolution, linearity, contrast, spatial accuracy and distortion were found to be adequate.

Soft Copy Display Luminance Measurements (cd/m^2):

Operator Console NEC Multisync EA192M LCD	Display Center	Top Left	Top Right	Bottom Left	Bottom Right	Units
Luminance Measurements in cd/m^2	120	104	103	117	108	cd/m^2

Operator Console NEC Multisync EA192M LCD	Maximum Luminance Center Display	Minimum Luminance Center Display	Luminance Uniformity Percent Difference
Luminance Measurements in cd/m^2	120 cd/m^2	0.1 cd/m^2	15%

Conclusion:

Maximum and minimum luminance of the display monitor as well as the luminance uniformity were found to be adequate. The maximum luminance of diagnostic quality monitor should exceed 90 cd/m^2, the minimum luminance should be less than 1.2 cd/m^2 and the luminance uniformity depicted by the percent difference in the maximum luminance values measured in the image display area should be less than or equal to 30%.

15. EVALUATION OF SITE'S TECHNOLOGIST QC PROGRAM

Technologist QC program is well established using the GE QC Phantom.
Magnet Helium boil off and pressure are also monitored.

Technologist QC Procedures	PASS/FAIL/NA
1. Center Frequency and Transmitter Gain Check (Daily)	PASS
2. Artifact Evaluation (Daily)	PASS
3. SNR measurement (Daily)	PASS
4. Visual Checklist (Monthly)	N/A

Conclusion:

Technologist QC program is well established. Daily QC procedures and SNR measurements are properly performed and documented.

16. ASSESSMENT OF MRI SAFETY PROGRAM

a. High magnetic field warning signs are properly posted. Access to Safety Zone III (Control Area) is limited to authorized personnel and controlled by lock and key. Access to Safety Zone IV (MRI Scanner Room) was also properly posted with a High Magnetic Field warning sign.

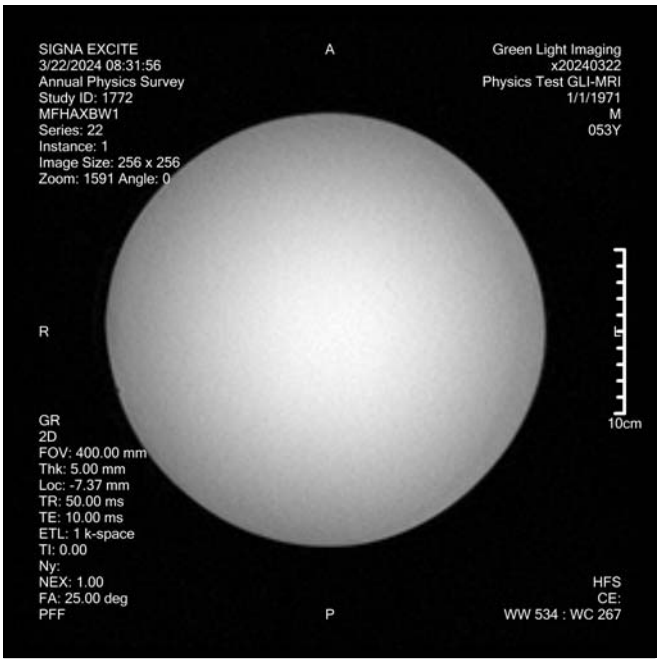
b. MRI Safety Policy & Procedures are available on file.

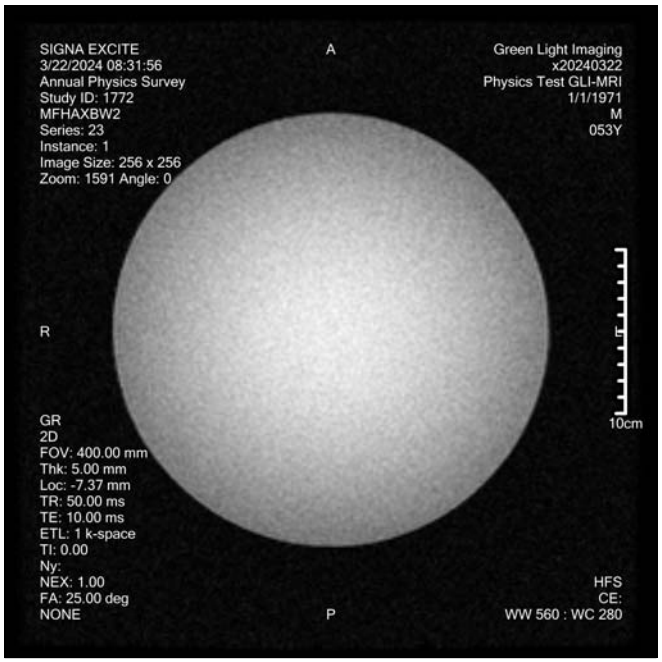
MRI Safety Policies and Procedures address the following subjects:		YES/NO/NA
1.	Designated MR safety officer	Yes
2.	Site access restrictions (MR zones)	Yes
3.	Documented MR Safety education/training for all personnel	Yes
4.	Patient and non-MR personnel screening	Yes
5.	Pediatric patients	N/A*
6.	Magnet quench	Yes
7.	Cryogen safety	Yes
8.	Acoustic noise	Yes
9.	Pregnant patients and staff	Yes
11.	Contrast agent safety	Yes
12.	Sedations	Yes
13.	Thermal burns	Yes
14.	Emergency code procedures	Yes
15.	Device and object screening	Yes
16.	Designation of MR safe/MR conditional status	Yes
17.	Reporting of MR safety incidents or adverse incidents	Yes
18.	Patient communication	Yes
19.	Infection control and medical waste	Yes

ACR Criteria for Compliance:		YES/NO/NA
1.	Written policies are present and readily available to facility staff.	Yes
2.	Written policies are reviewed and updated on a regular basis.	Yes
3.	Facility has appropriate MR safety warning signage and methods of controlled access.	Yes

Overall Status: Pass/Fail **Pass**

Note:
*Pediatric patient scans are generally not performed.


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
MFHAXBW1
Series: 22
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
A
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: -7.37 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
P
WW 534 : WC 267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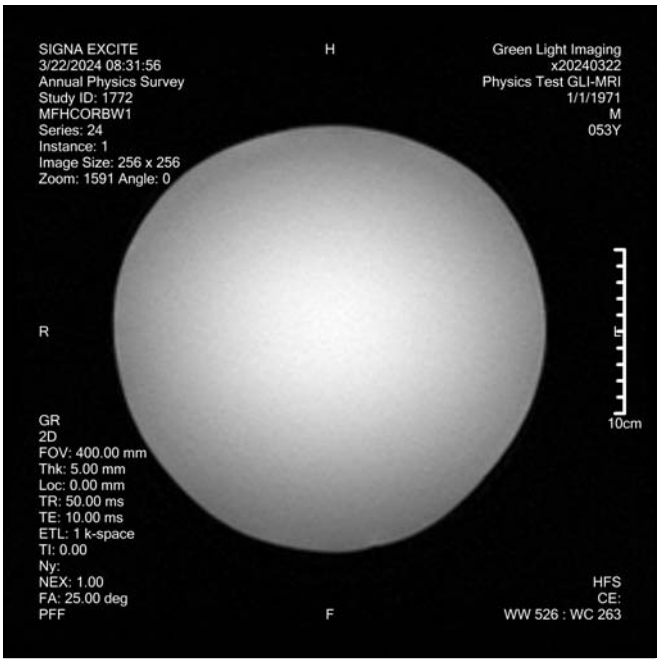
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
A
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: -7.37 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
P
WW 560 : WC 280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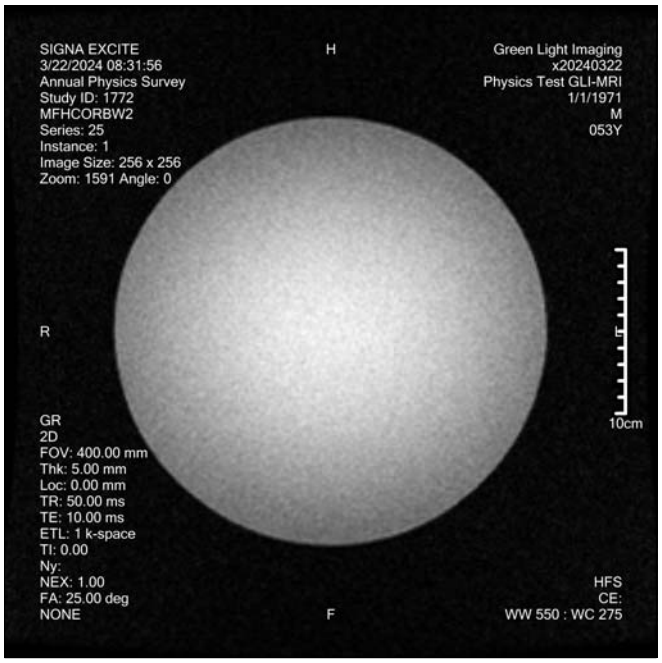
Series: 24
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
F
WW 526 : WC 263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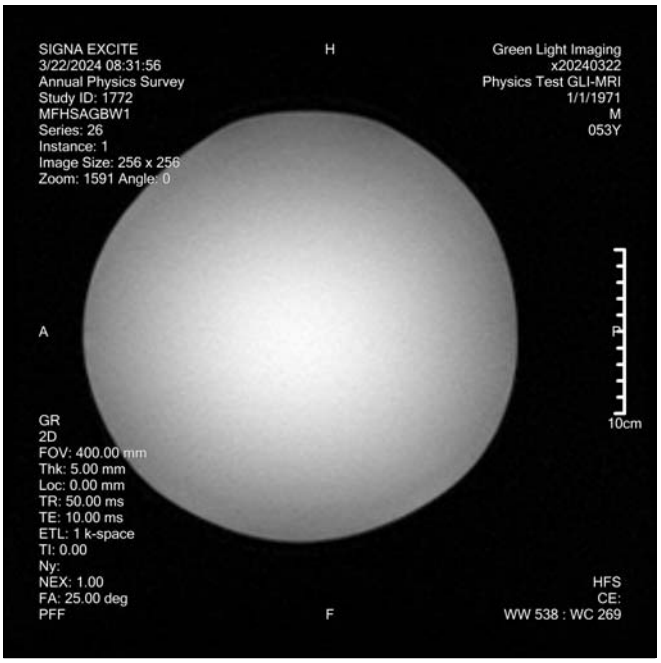
Series: 25
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
F
WW 550 : WC 275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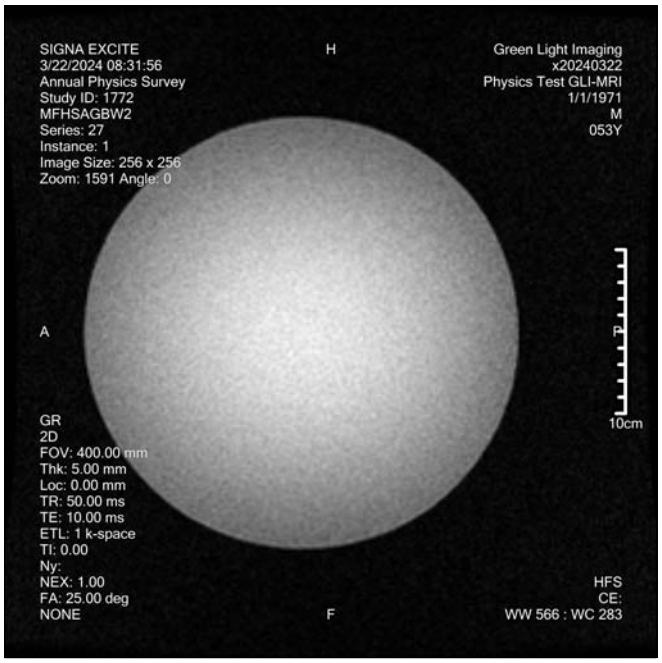
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
P
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
F
WW 538 : WC 269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Instance: 1
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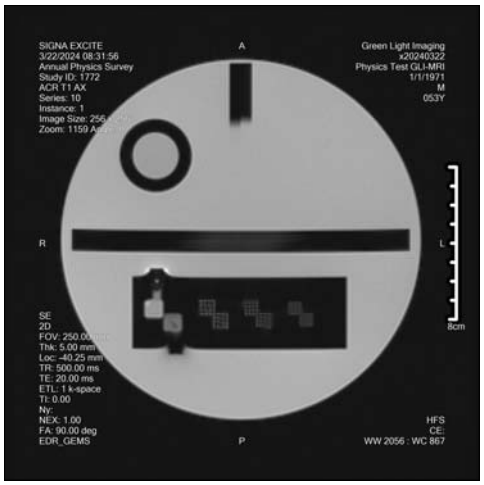
Zoom: 1591 Angle: 0
H
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
P
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
F
WW 566 : WC 283


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR SAGITTAL LOCATOR
Series: 8
Instance: 1
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 10.00 mm
Loc: -2.44 mm
TR: 200.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1171 : WC 585
8cm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Annual Physics Survey
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ACR T1 AX
Series: 10
Instance: 1
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -40.25 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 2056 : WC 867
8cm


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 2
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -30.25 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 2034 : WC 1017
8cm


SIGNA EXCITE
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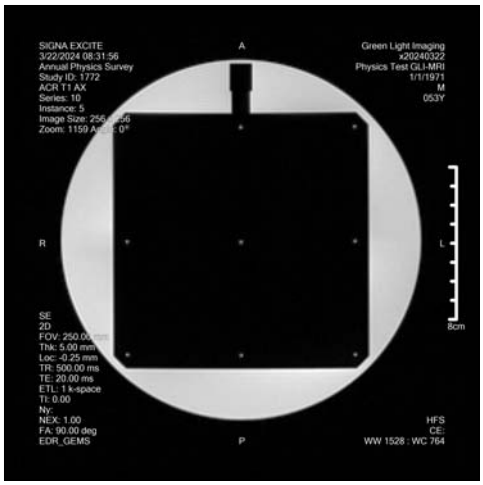
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 3
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -20.25 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1481 : WC 740
8cm


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 4
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -10.25 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1504 : WC 752
8cm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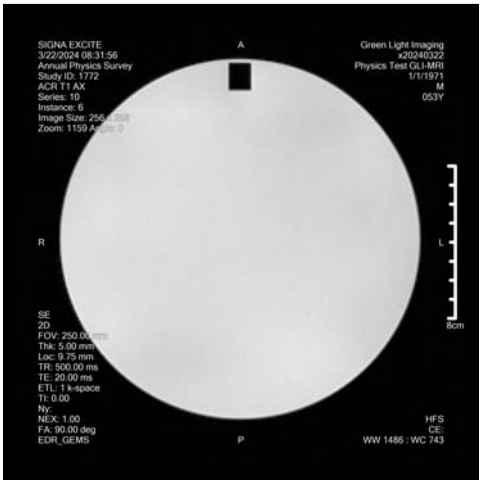
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 5
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -0.25 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1528 : WC 764
8cm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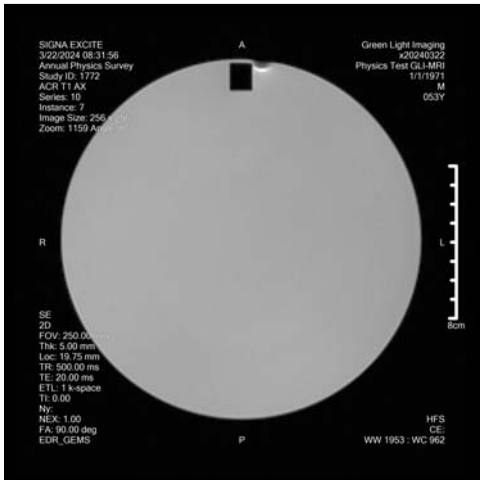
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 6
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 9.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1486 : WC 743
8cm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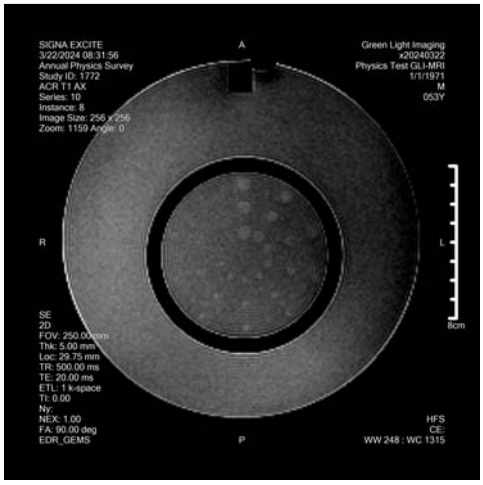
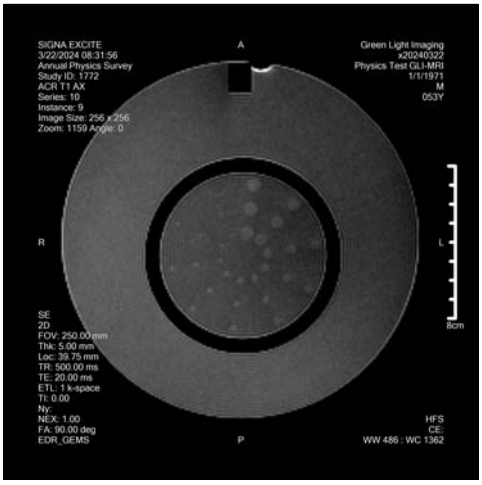
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 7
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 19.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1953 : WC 962
8cm


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 8
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 29.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 248 : WC 1315
8cm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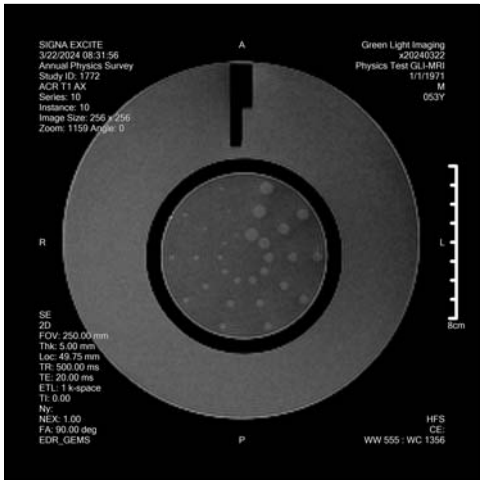
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 9
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 39.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 486 : WC 1362
8cm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Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 10
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 49.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
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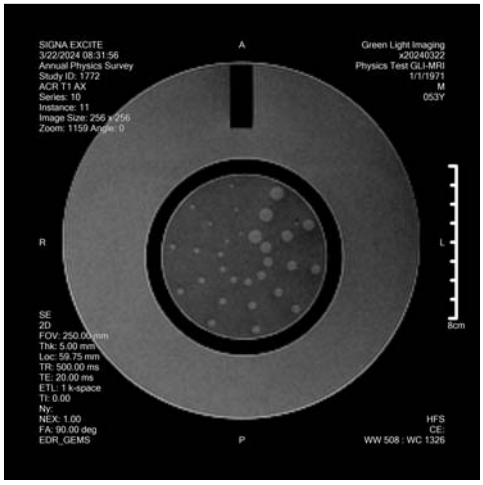
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 555 : WC 1356
8cm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Annual Physics Survey
Study ID: 1772
ACR T1 AX
Series: 10
Instance: 11
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 59.75 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 508 : WC 1326
8cm


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR SAGITTAL LOCATOR
Series: 8
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 10.00 mm
Loc: 2.44 mm
TR: 200.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1171 : WC 585


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 1
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -40.25 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1408 : WC 598


SIGNA EXCITE
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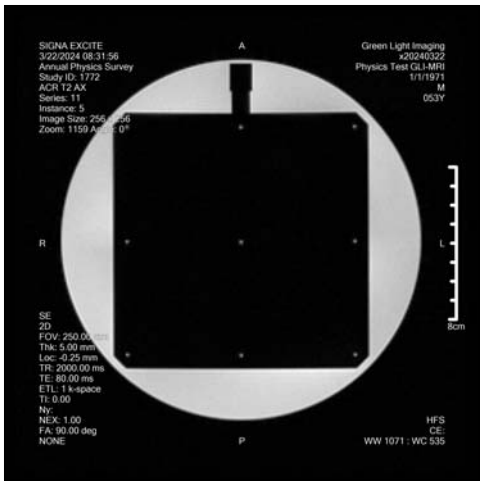
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 2
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -30.25 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1351 : WC 675


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 3
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -20.25 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1010 : WC 505


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 4
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -10.25 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1043 : WC 521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Series: 11
Instance: 5
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -0.25 mm
TR: 2000.00 ms
TE: 80.00 ms
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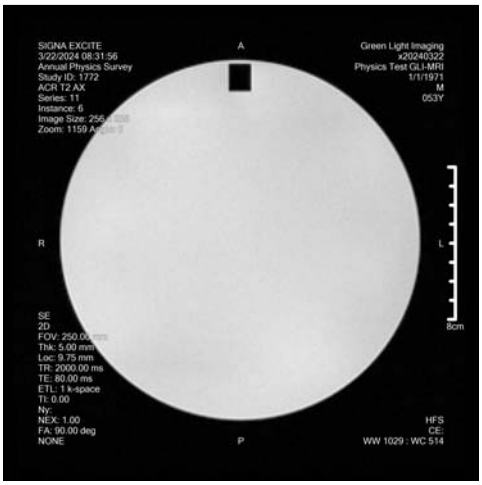
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1071 : WC 535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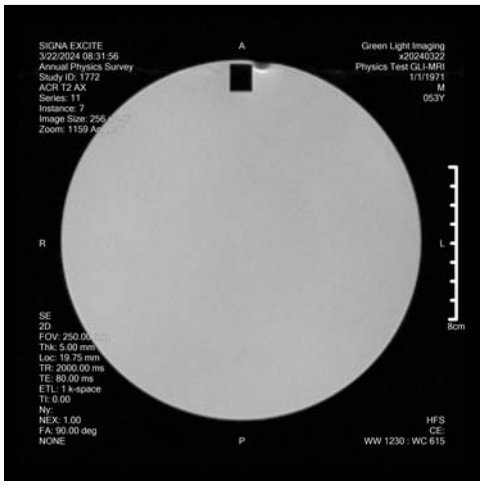
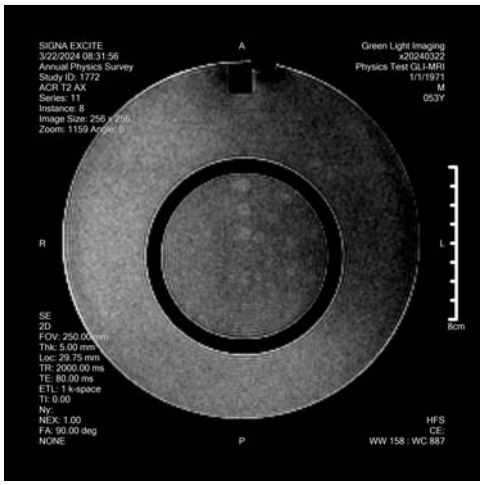
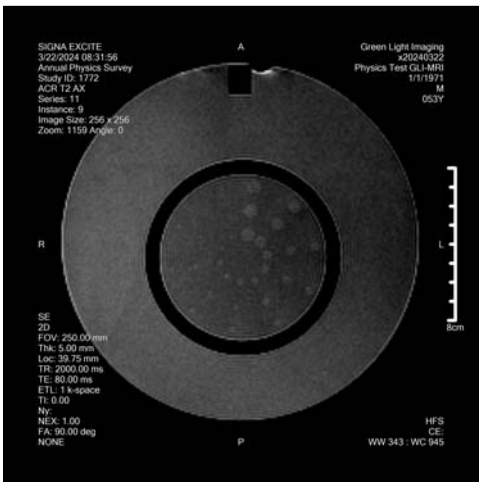
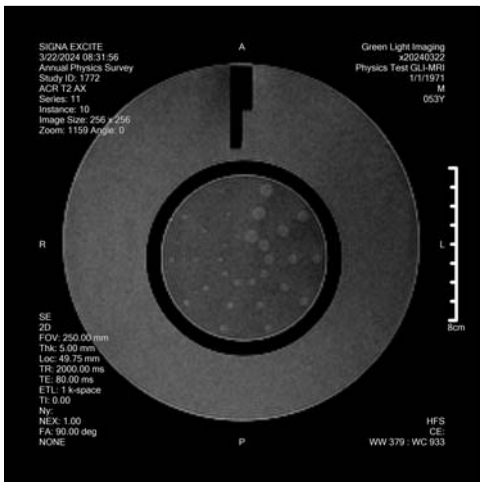
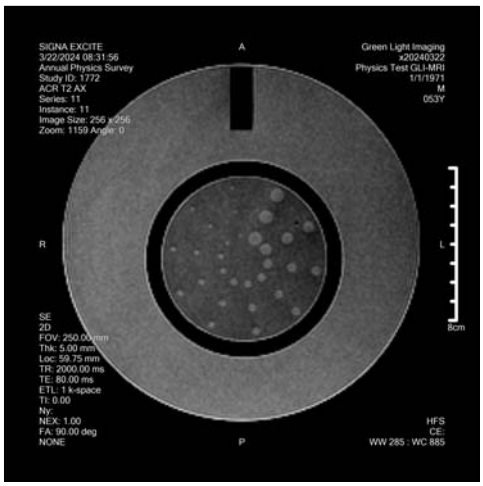
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 6
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 9.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1029 : WC 514


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 7
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 19.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1230 : WC 615


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 8
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 29.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 158 : WC 887

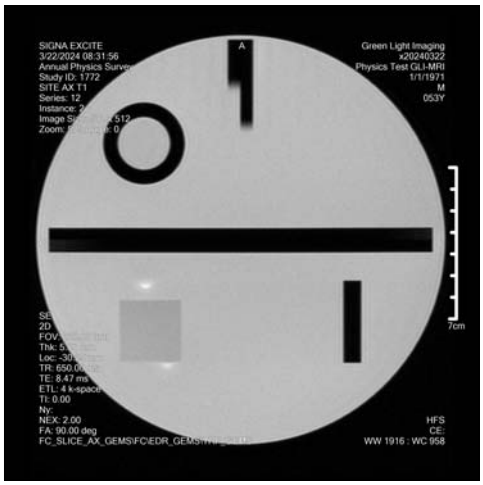

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 9
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 39.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 343 : WC 945


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 10
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 49.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 379 : WC 933


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR T2 AX
Series: 11
Instance: 11
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 59.75 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 285 : WC 885

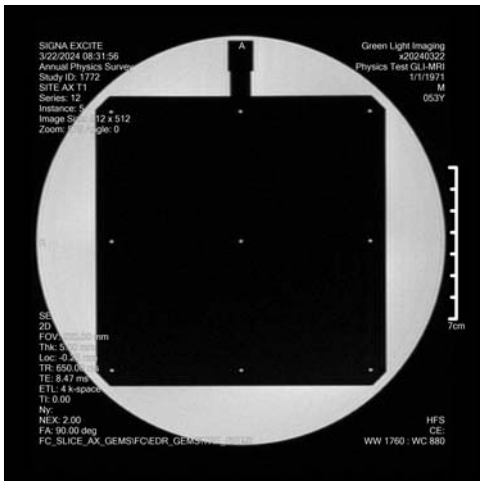

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR SAGITTAL LOCATOR
Series: 4
Instance: 1
Image Size: 256 x 256
Zoom: 1159 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
H
A
P
F
8cm
SE
2D
FOV: 250.00 mm
Thk: 10.00 mm
Loc: 2.44 mm
TR: 200.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
HFS
CE:
WW 1171 : WC 585


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance:
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1473 : WC 660

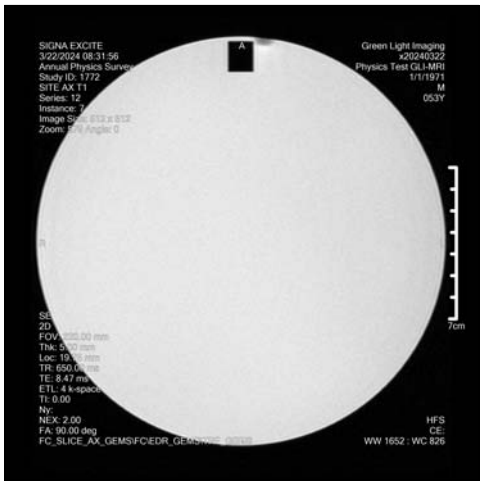

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1916 : WC 958

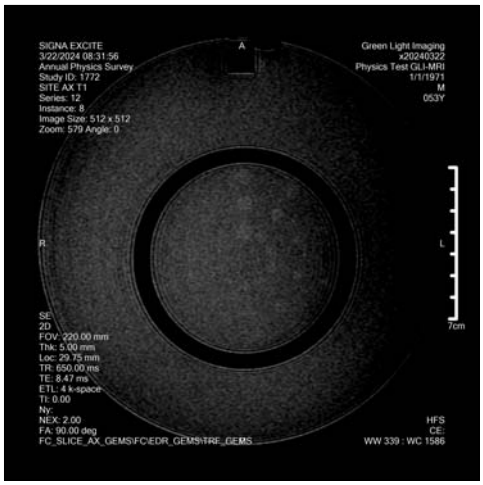

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance:
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1622 : WC 811

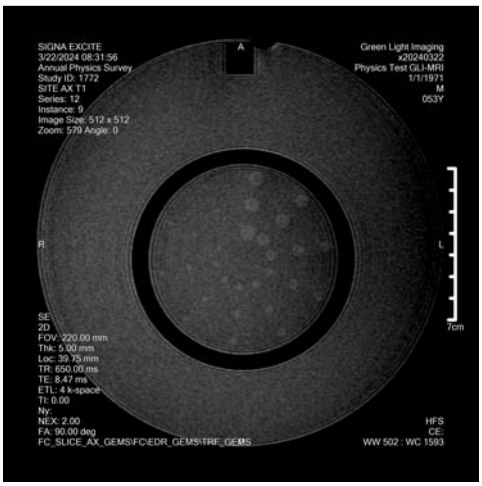

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance:
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1645 : WC 822

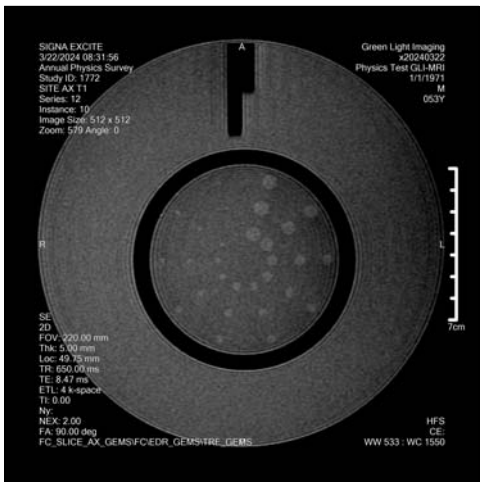

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1760 : WC 880

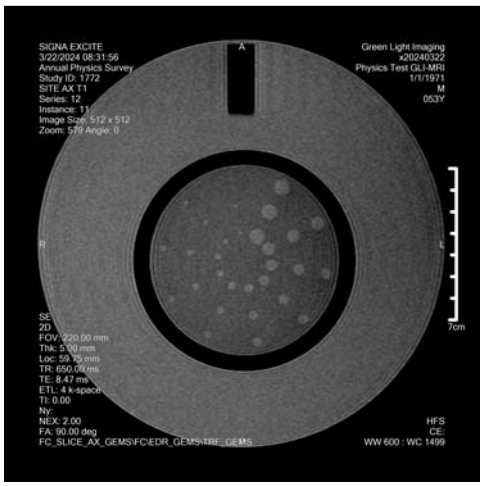

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance:
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
Thk: 5.00 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1610 : WC 805


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance:
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
Thk: 5.00 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 1652 : WC 826


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance: 8
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 29.75 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 339 : WC 1586

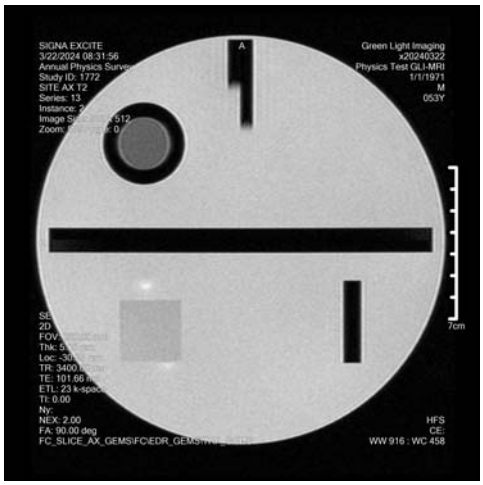

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance: 9
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 39.75 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 502 : WC 1593


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance: 10
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 49.75 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 533 : WC 1550


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T1
Series: 12
Instance: 11
Image Size: 512 x 512
Zoom: 579 Angle: 0
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 59.75 mm
TR: 650.00 ms
TE: 8.47 ms
ETL: 4 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
HFS
CE:
WW 600 : WC 1499

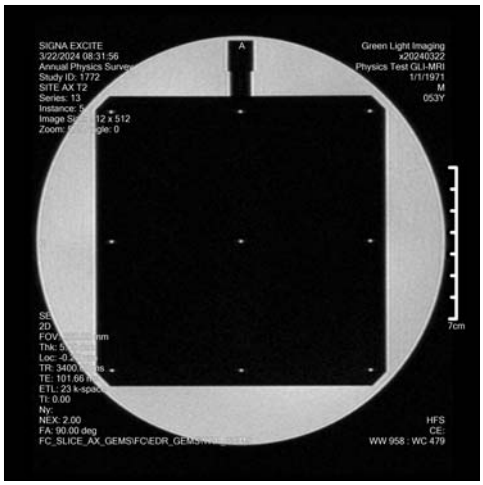

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
ACR SAGITTAL LOCATOR
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
H
A
P
8cm
SE
2D
FOV: 250.00 mm
Thk: 10.00 mm
Loc: -2.44 mm
TR: 200.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
EDR_GEMS
F
HFS
CE:
WW 1171 : WC 585


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: -40.00 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 938 : WC 469


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: -30.00 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 916 : WC 458

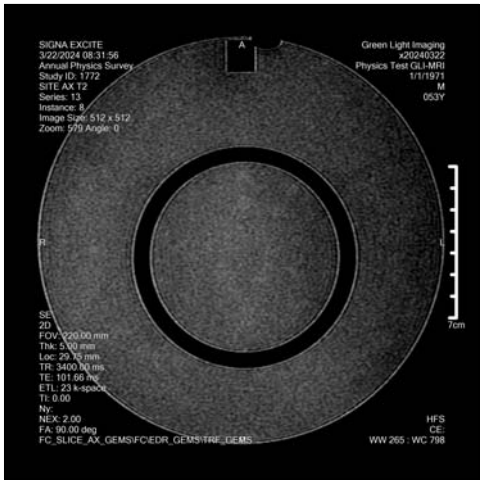

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: -20.00 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 890 : WC 445

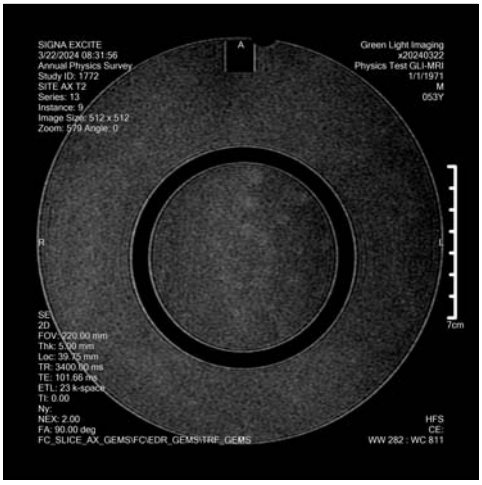

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: -10.00 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 893 : WC 446

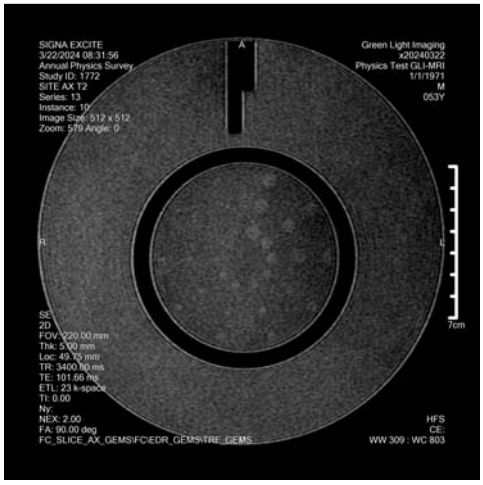

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: -0.00 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 958 : WC 479

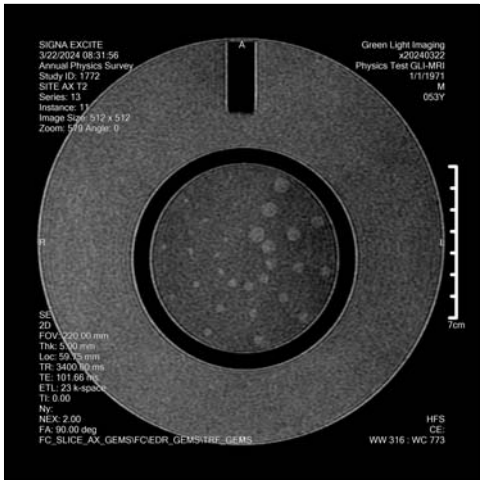

SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: 9.99 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 876 : WC 438


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
7cm
SE
2D
Thk: 5.00 mm
Loc: 19.99 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS
HFS
CE:
WW 883 : WC 441


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
Image Size: 512 x 512
Zoom: 579 Angle: 0
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 29.75 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
CE:
WW 265 : WC 798


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
Image Size: 512 x 512
Zoom: 579 Angle: 0
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 39.75 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
CE:
WW 282 : WC 811


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
Image Size: 512 x 512
Zoom: 579 Angle: 0
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 49.75 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
CE:
WW 309 : WC 803


SIGNA EXCITE
3/22/2024 08:31:56
Annual Physics Survey
Study ID: 1772
SITE AX T2
Series: 13
Green Light Imaging
x20240322
Physics Test GLI-MRI
1/1/1971
M
053Y
A
Image Size: 512 x 512
Zoom: 579 Angle: 0
R
L
7cm
SE
2D
FOV: 220.00 mm
Thk: 5.00 mm
Loc: 59.75 mm
TR: 3400.00 ms
TE: 101.66 ms
ETL: 23 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
CE:
WW 316 : WC 773