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 Verison: 12.0

Survey Date: 01/31/2020 and 02/12/2020

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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 Sagittal Localizer:
Spin Echo, TR 200, TE 20, 1 NEX, FA 90, Slice Thickness 20 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, 1 NEX, 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, 1 NEX, FA 90, Slice Thickness 5 mm Skip 5 mm, 25 cm FOV
256x256 matrix, ± 15.63/10.0 kHz BW, 8:56 Scan Time, Scan Options: None

Site T1-weighted Scan:
FSE-XL, TR 450, TE 11.4, ET 3, 2 NEX, FA 90, Slice Thickness 5 mm Skip 5 mm, 18.0x24.0 cm FOV, 192x256 matrix, ± 15.63 kHz BW, 1:30 Scan Time, Scan Options: FC, TRF, Fast

Site T2-weighted Scan:
FSE-XL, TR 4000, TE 102, ET 17, 2 NEX, Slice Thickness 5 mm Skip 5 mm, 18.0x24.0 cm FOV, 224x320 matrix, ± 31.25 kHz BW, 1:28 Scan Time, Scan Options: FC, EDR, TRF, FAST

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. Couple of items need to be brought to the attention of field service engineer at the next scheduled PM. Sagital laser light localizer is slightly off center and table in and out movement is not very smooth.

* Slice positioning accuracy was found to be adequate, within 1 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.

* Signal to noise measurements were found to be adequate, consistent with pulse sequence parameters.

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

* Technologists QC program to be established. Recommend including daily SNR measurements in the QC program.

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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Date: 02/15/2020

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Medical Physicist

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 sagittal 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

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 63.860691 MHz.

Conclusion:
Coil tuning and transmitter gain parameters were found to be adequate, well within acceptable operating ranges. In general, weekly variation in center frequency is estimated not to exceeded ± 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

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 115 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

Test Protocol: ACR T1 and T2 Weighted Sequences

Geometric accuracy was tested in both axial and sagittal planes to assess performance in all three orthogonal gradient directions. Horizontal and vertical distance measurements were made using the system distance measuring tool. The sagittal 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
Sagittal Localizer					
Sag. Image #1	---	147 mm	---	---	- 1 mm
T1w Scan					
Axial Image #1	188 mm	189 mm	---	---	- 2 mm
Axial Image #5	188 mm	189 mm	188 mm	189 mm	- 2 mm
T2w Scan					
Axial Image #1	188 mm	188 mm	---	---	- 2 mm
Axial Image #5	188 mm	189 mm	189 mm	189 mm	- 2 mm

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

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	1.1 mm
Site T2 Weighted Sequence	0.9 mm	1.0 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

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	52 mm	54 mm	5.3 mm
ACR T2 Weighted Sequence	51 mm	51 mm	5.1 mm
Site T1 Weighted Sequence	55 mm	52 mm	5.3 mm
Site T2 Weighted Sequence	55 mm	53 mm	5.4 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

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	0.0 mm	1.0 mm
Actual Slice Displacement Error	0.0 mm	0.5 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	0.0 mm	1.0 mm
Actual Slice Displacement Error	0.0 mm	0.5 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

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	1461	1340	96%
ACR T2 Weighted Sequence	894	828	96%
Site T1 Weighted Sequence	1566	1387	94%
Site T2 Weighted Sequence	854	761	94%

Conclusion:
System image uniformity was found to be adequate. 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

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	11.1	10.7	12.4	13.8	1414	0.002
ACR T2 Weighted Sequence	10.3	10.2	13.8	13.9	869	0.004
Site T1 Weighted Sequence	10.8	10.2	11.8	11.0	1488	0.001
Site T2 Weighted Sequence	13.8	13.1	15.4	16.0	812	0.003

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

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	9	39
ACR T2 Weighted Sequence	10	10	10	8	38
Site T1 Weighted Sequence	10	10	10	8	38
Site T2 Weighted Sequence	10	10	10	5	35

Conclusion:
The low contrast resolution was found to be adequate. However, a significant drop compared to previous results was noted. 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 Spherical Phantom

Test Protocol: GRE Sequence, TR 67 msec, TE 10 msec, FA 25 degrees, 40 cm FOV, 256x256 Matrix, 1 Slice, Thickness 5 mm, NEX 1, BW1 ± 2.02 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:	63.860735	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)	266.0 mm	264.0 mm	0.3 ppm
Coronal Plane (27 cm DSV)	260.0 mm	263.0 mm	0.5 ppm
Sagittal Plane (27 cm DSV)	266.0 mm	264.0 mm	0.3 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 124 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
Standard GE Head Coil	1122	1162	1079	11.0	5.4	11.4

RF Coil	SNR	Percent Image Uniformity	Percent Signal Ghosting
Standard GE Head Coil	208	96%	0.0%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images.
Image uniformity was 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 138 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	1148	1548	909	14.0	2.7	16.0

RF Coil	SNR	Percent Image Uniformity	Percent Signal Ghosting
8 Ch High Res Brain Array by MRI Device	430	74%	0.1%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images.
Image uniformity was 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 Spherical Phantom with Body Loader

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 170 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
Integrated Body Coil	1118	1188	1022	24.5	10.0	27.0

RF Coil	SNR	Percent Image Uniformity	Percent Signal Ghosting
Integrated Body Coil	112	92%	0.1%

Conclusion:
No significant image artifact or ghosting was noted in reconstructed images.
Image uniformity was 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, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 153 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	---	2160	---	27.5	4.8	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
8 Ch Body Array by GE Full FOV	450	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: GE 17 cm Diameter Spherical 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 155 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
QUADKNEE T/R Knee-Foot Coil	---	2638	---	8.6	3.9	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
QUADKNEE T/R Knee-Foot Coil	676	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 125 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
HD TRknee PA	---	8712	---	43.5	8.1	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
HD TRknee PA	1076	n/a	n/a

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

13. RF COIL PERFORMANCE EVALUATION (Continued)

RF Coil 7: SHLDRPA4 Small Shoulder Coil
Phantom: GE Small (10 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 151 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
SHLDRPA4 Small Shoulder Coil	---	4676	---	29.0	6.7	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
SHLDRPA4 Small Shoulder Coil	698	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, 25 cm FOV, 256x256 matrix, BW ± 15.63 kHz, 1:23 Scan Time, Transmitter Gain 143 dB.

Results: Axial Orientation

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
SHLDRPA4 Large Shoulder Coil	---	4436	---	22.0	5.5	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
SHLDRPA4 Large Shoulder Coil	807	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 146, 145 and 139 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	---	2495	---	23	5.1	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
8ch CTL Spine Array Coil CTL123	489	n/a	n/a

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
CTL234	---	3736	---	26	5.2	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
CTL234	718	n/a	n/a

RF Coil	Mean Signal	Max Signal	Min Signal	Bkg Signal	Bkg S.D. Noise	Ghost Signal
CTL456	---	3511	---	27	5.2	---

RF Coil	Maximum SNR	Percent Image Uniformity	Percent Signal Ghosting
CTL456	675	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: Unfors Xi Photometer
Luminance Measurement Units: cd/m^2

Soft Copy SMPTE Pattern Evaluation:
Overall appearance of the SMPTE pattern was found to be adequate. Luminance patterns looked uniform, without any significant geometric distortion or artifacts. The 5% and 95% patches were properly visualized. High contrast visibility patterns were found to be adequate.

Soft Copy Display Maximum 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	132	128	119	131	123	cd/m^2

Operator Console Multisync EA192M LCD	Center of Display Max Luminance	Average of 4 Corner Luminances	Percent Difference of Lum. Values
Luminance Measurements in cd/m^2	132	125	10%

Conclusion:
Maximum brightness and uniformity of the monitor was found to be adequate. Maximum brightness of diagnostic quality monitors should exceed 90 cd/m^2 and luminnance values measured at the four corners of the monitor should be whithin 30% of the maximum brightness measured at the center of the monitor.

15. EVALUATION OF SITE'S TECHNOLOGIST QC PROGRAM

Technologist QC program to be established using the GE QC Phantom.
Magnet Helium boiloff and pressure will also be 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)	N/A
4. Visual Checklist (Monthly)	PASS

Conclusion:
Technologist QC program to be performed using the GE QC Phantom. Recommend daily SNR measurements and monthly Visual Checklist to be performed and properly 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.

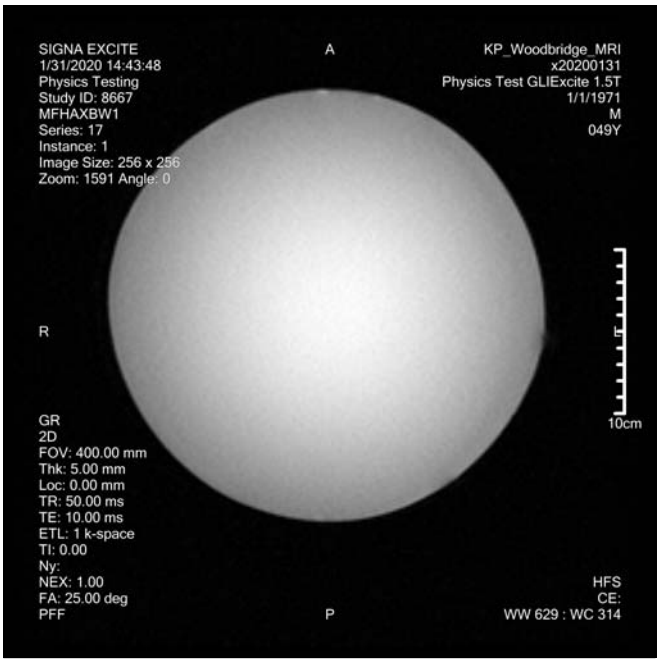
b. MRI Safety Policy & Procedures are available on file.

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.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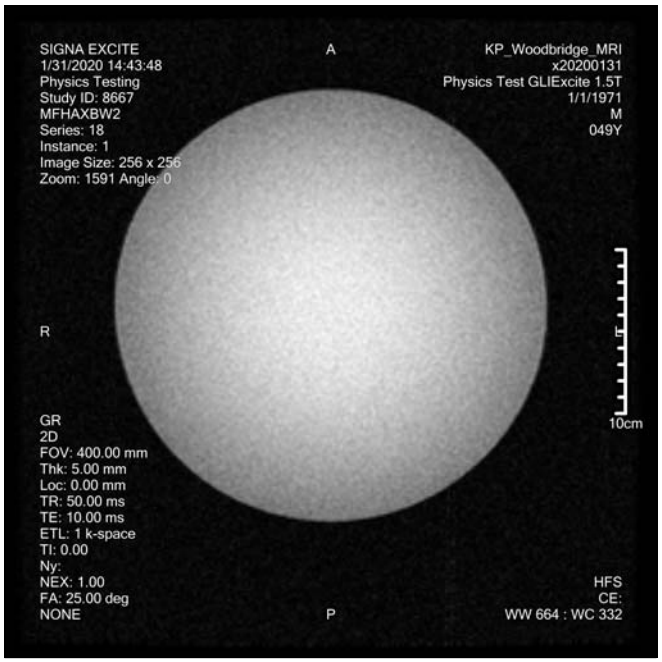
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
MFHAXBW1
Series: 17
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
A
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
P
WW 629 : WC 314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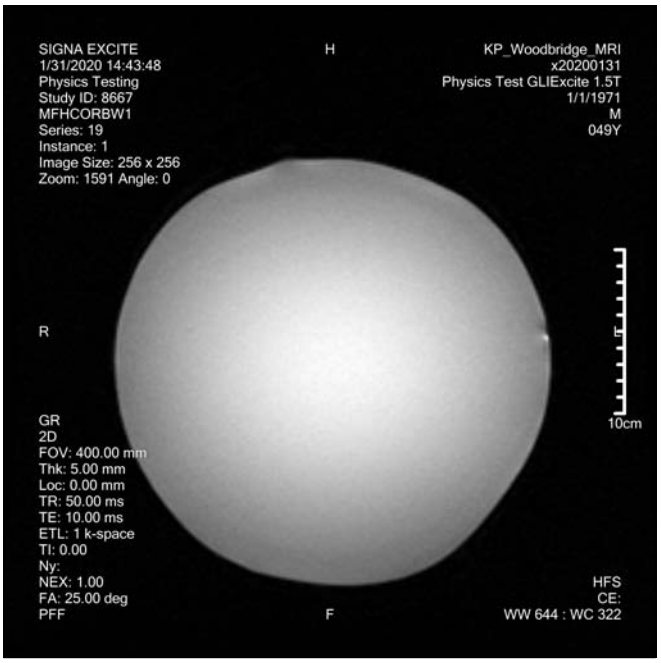
MFHAXBW2
Series: 18
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
A
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
P
WW 664 : WC 332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Series: 19
Instance: 1
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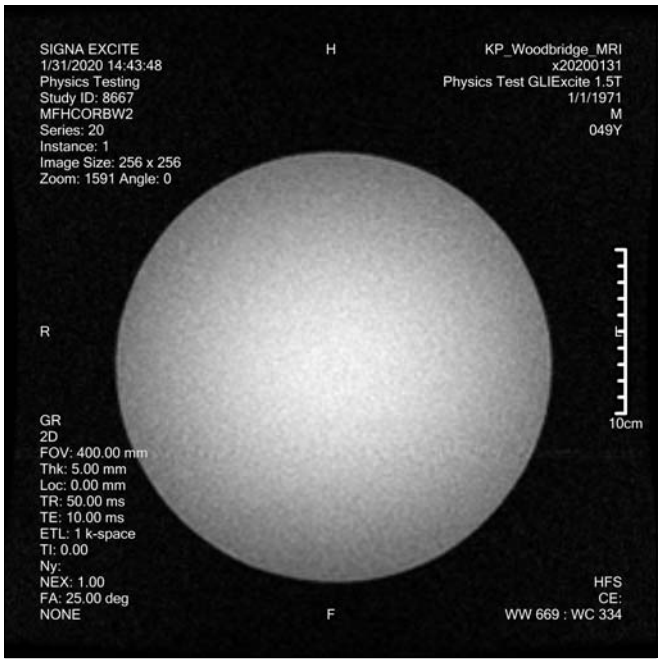
Zoom: 1591 Angle: 0
H
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
F
WW 644 : WC 322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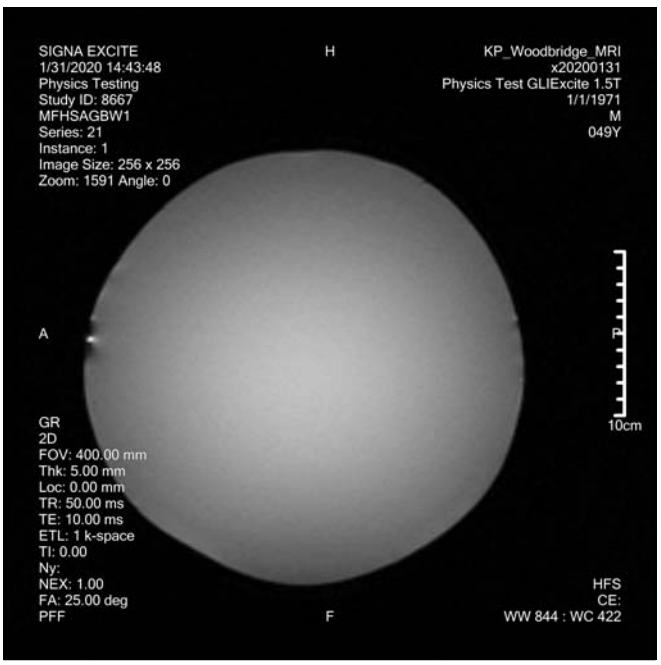
MFHCORBW2
Series: 20
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
R
L
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
F
WW 669 : WC 334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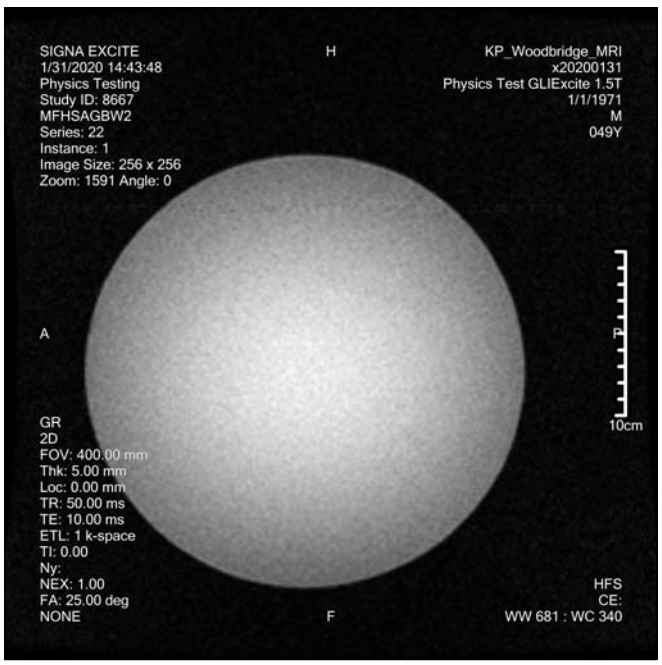
Physics Testing
Study ID: 8667
MFHSAGBW1
Series: 21
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
P
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
PFF
HFS
CE:
F
WW 844 : WC 422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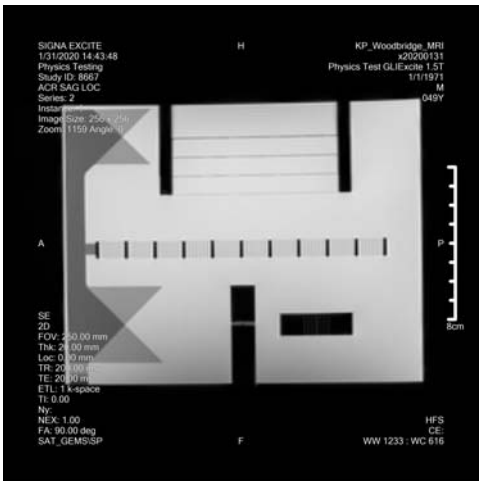
MFHSAGBW2
Series: 22
Instance: 1
Image Size: 256 x 256
Zoom: 1591 Angle: 0
H
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
P
10cm
GR
2D
FOV: 400.00 mm
Thk: 5.00 mm
Loc: 0.00 mm
TR: 50.00 ms
TE: 10.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 25.00 deg
NONE
HFS
CE:
F
WW 681 : WC 340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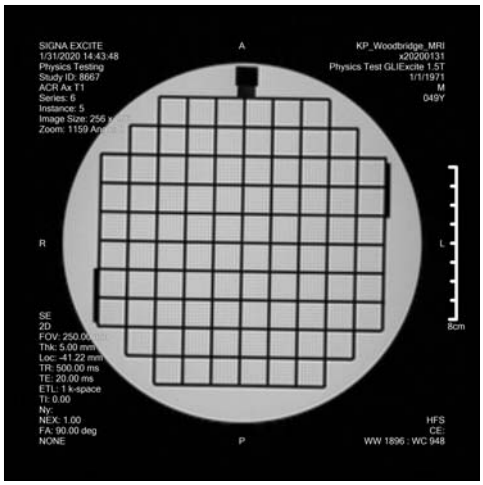
Physics Testing
Study ID: 8667
ACR SAG LOC
Series: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
NEX: 1.00
FA: 90.00 deg
SAT_GEMS\SP
HFS
CE:
WW 1233 : WC 616


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 1
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -81.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1147 : WC 567


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -71.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1587 : WC 793


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 3
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -61.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1579 : WC 789


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 4
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -51.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1607 : WC 803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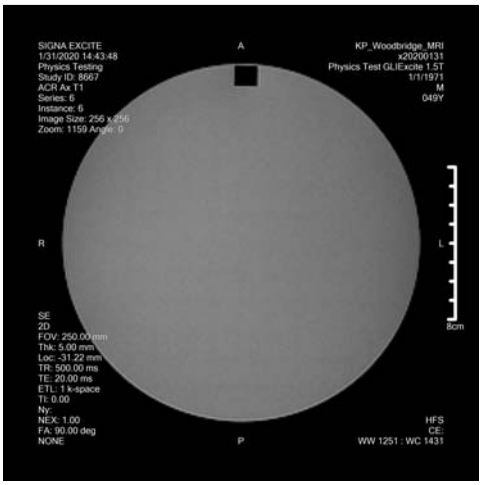
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 5
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -41.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1896 : WC 948


SIGNA EXCITE
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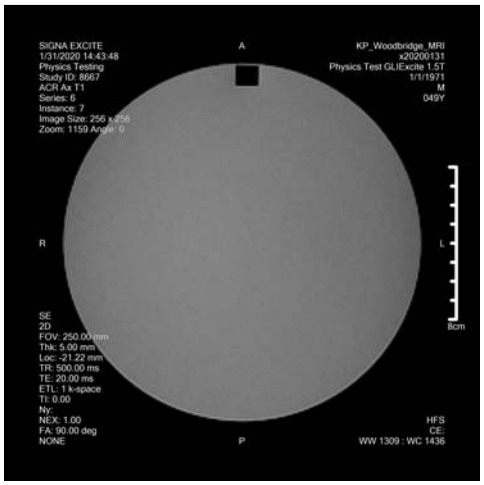
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 6
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -31.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1251 : WC 1431


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 7
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -21.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
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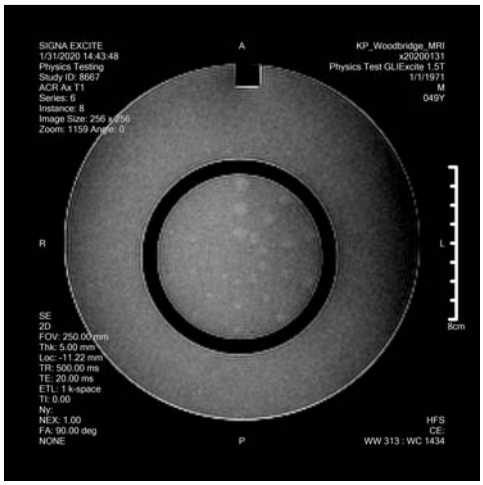
HFS
CE:
WW 1309 : WC 1436


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 8
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -11.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
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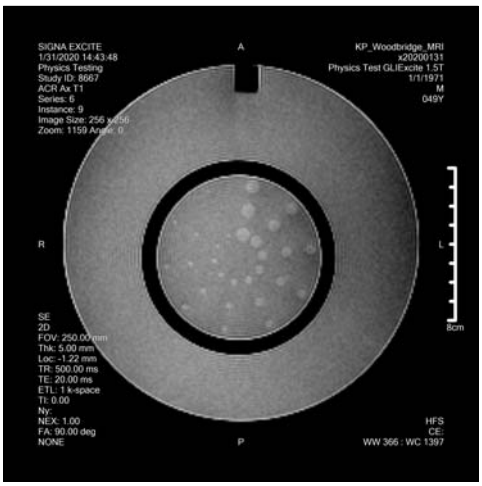
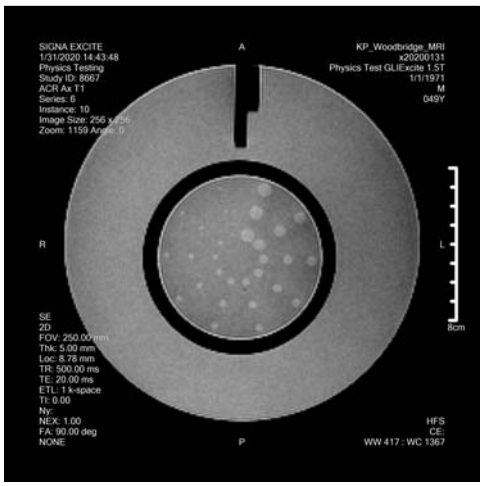
FA: 90.00 deg
NONE
HFS
CE:
WW 313 : WC 1434


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 9
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: -1.22 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 366 : WC 1397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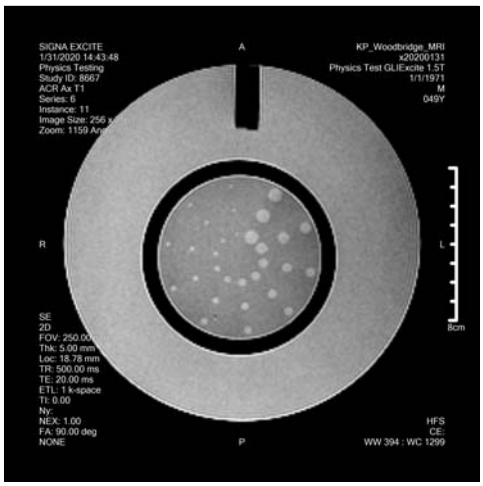
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 10
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 8.78 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 417 : WC 1367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1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T1
Series: 6
Instance: 11
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 250.00 mm
Thk: 5.00 mm
Loc: 18.78 mm
TR: 500.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
NEX: 1.00
FA: 90.00 deg
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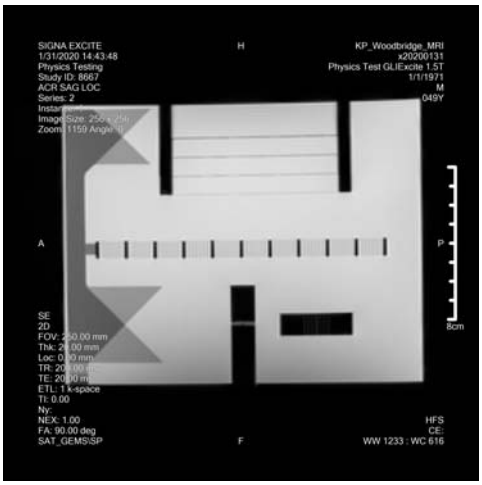
HFS
CE:
WW 394 : WC 1299


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR SAG LOC
Series: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
H
A
P
F
8cm
SE
2D
Thk: 20.00 mm
TR: 2000.00 ms
TE: 20.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
SAT_GEMS\SP
HFS
CE:
WW 1233 : WC 616


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -81.22 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 1060 : WC 530


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 4
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -71.22 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 973 : WC 486


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 6
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -61.22 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 979 : WC 489


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 8
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -51.22 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
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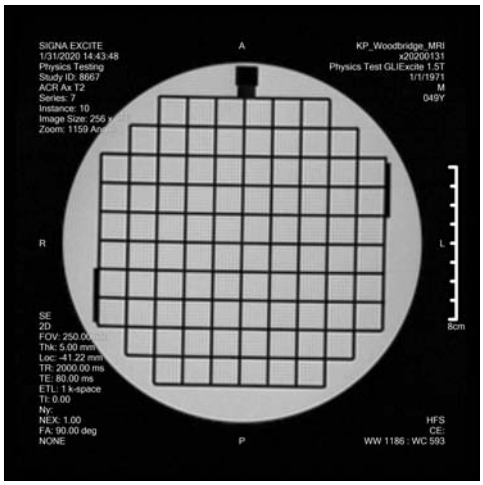
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1003 : WC 501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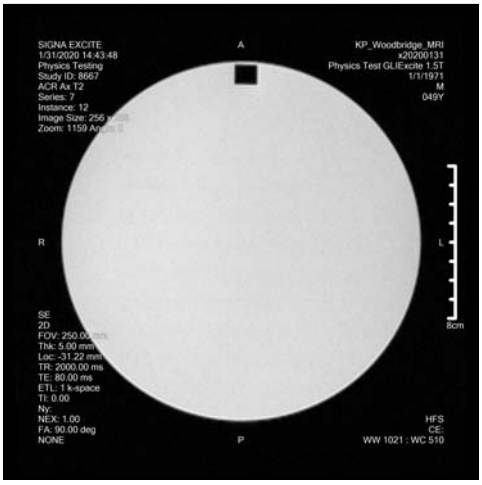
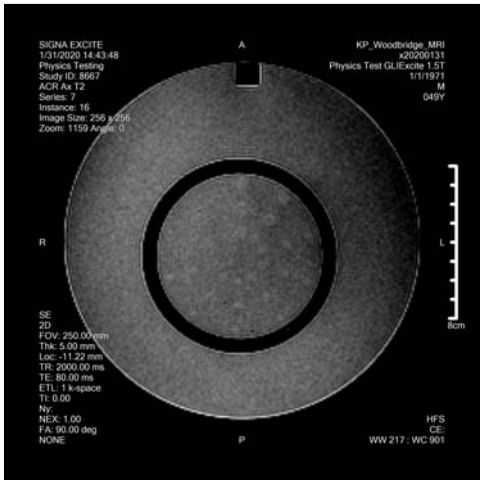
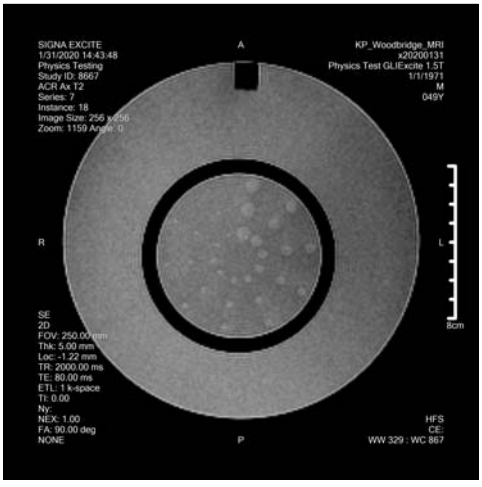
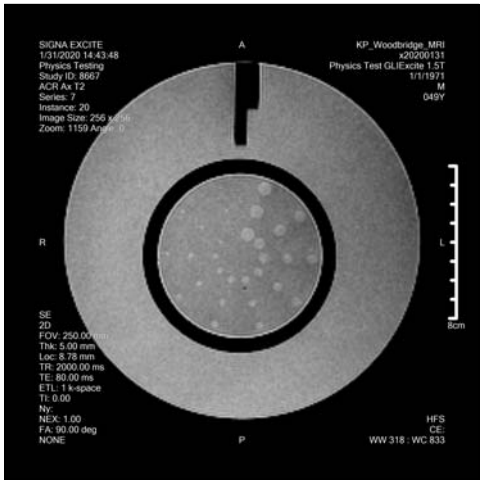
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 10
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -41.22 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1186 : WC 593

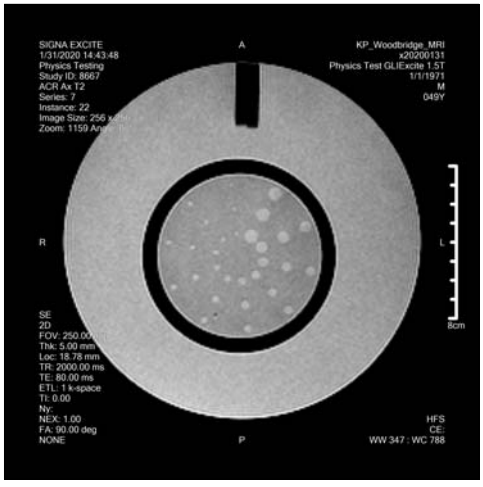

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 12
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -31.22 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1021 : WC 510

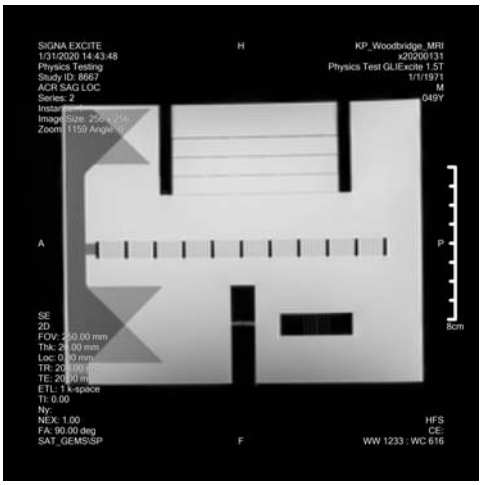

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 14
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -21.22 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 1032 : WC 524


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 16
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -11.22 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 217 : WC 901


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 18
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: -1.22 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 329 : WC 867


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 20
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: 8.78 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 318 : WC 833

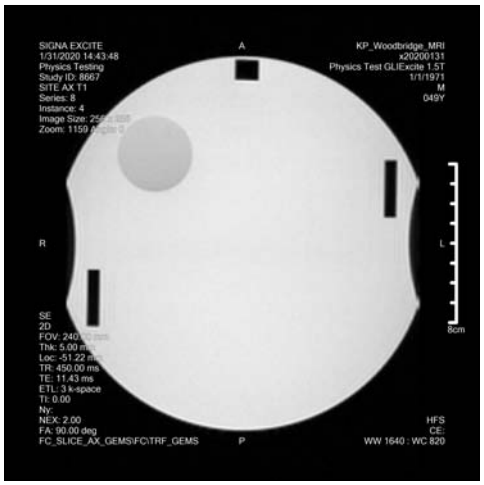

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR Ax T2
Series: 7
Instance: 22
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
P
8cm
SE
2D
Thk: 5.00 mm
Loc: 18.78 mm
TR: 2000.00 ms
TE: 80.00 ms
ETL: 1 k-space
TI: 0.00
Ny:
NEX: 1.00
FA: 90.00 deg
NONE
HFS
CE:
WW 347 : WC 788

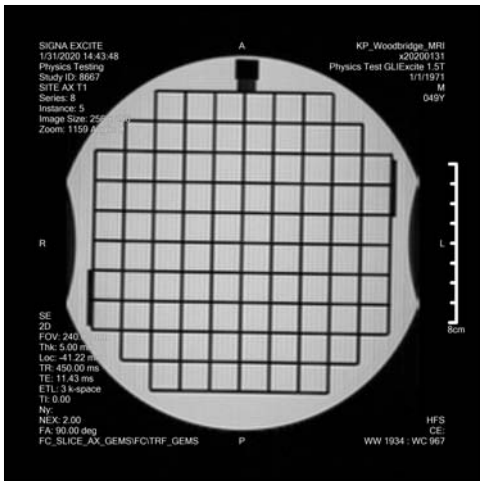

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR SAG LOC
Series: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
NEX: 1.00
FA: 90.00 deg
SAT_GEMS\SP
HFS
WW 1233 : WC 616

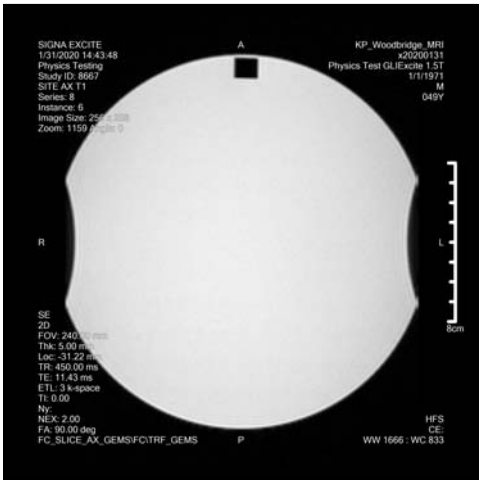

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 1
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -81.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1645 : WC 822

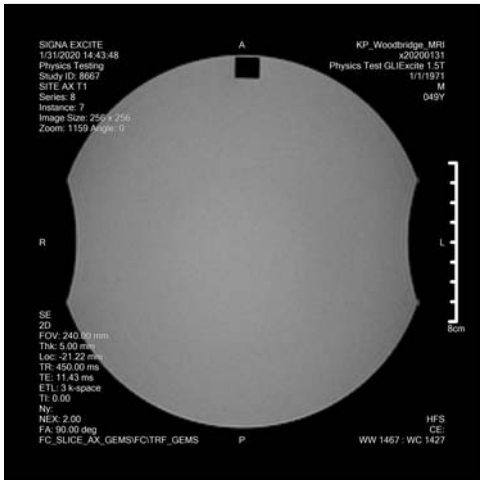

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -71.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1647 : WC 823

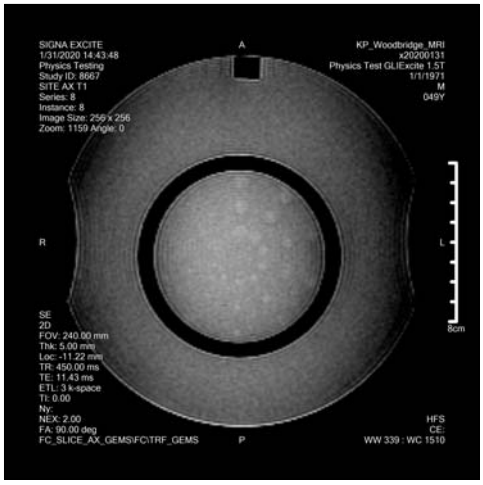

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 3
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -61.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1634 : WC 817

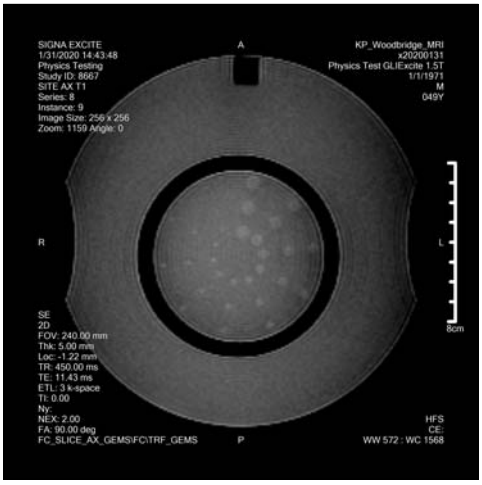

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 4
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -51.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1640 : WC 820

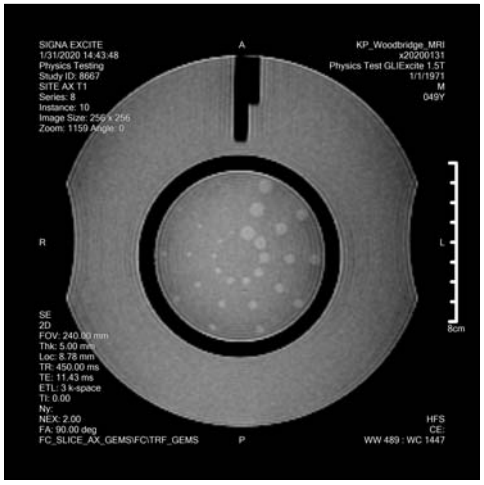

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 5
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -41.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1934 : WC 967

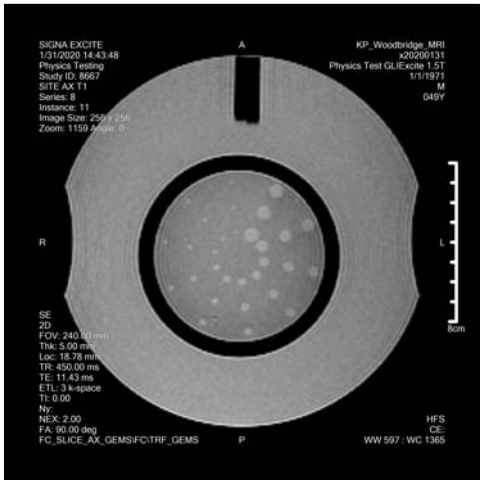

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 6
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -31.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1666 : WC 833

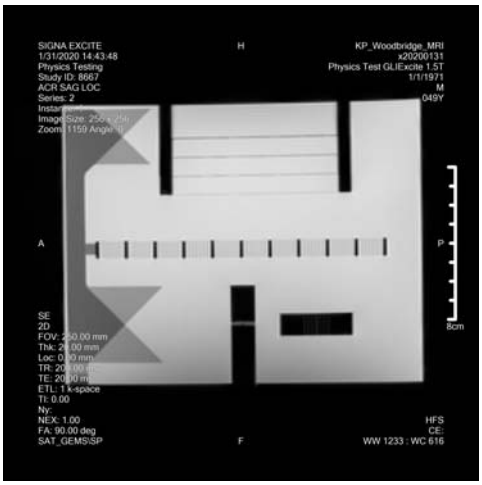

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 7
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -21.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 1467 : WC 1427


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 8
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -11.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 339 : WC 1510


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 9
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: -1.22 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 572 : WC 1568


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 10
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: 8.78 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 489 : WC 1447


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T1
Series: 8
Instance: 11
Image Size: 256 x 256
Zoom: 1159 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: 18.78 mm
TR: 450.00 ms
TE: 11.43 ms
ETL: 3 k-space
TI: 0.00
Ny:
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\TRF_GEMS
HFS
WW 597 : WC 1365

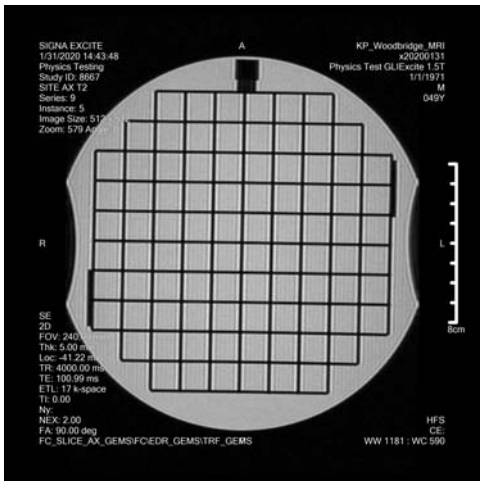

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
ACR SAG LOC
Series: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
H
A
P
F
8cm
SE
2D
NEX: 1.00
FA: 90.00 deg
SAT_GEMS\SP
HFS
WW 1233 : WC 616


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 1
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1055 : WC 527


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 2
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1023 : WC 511

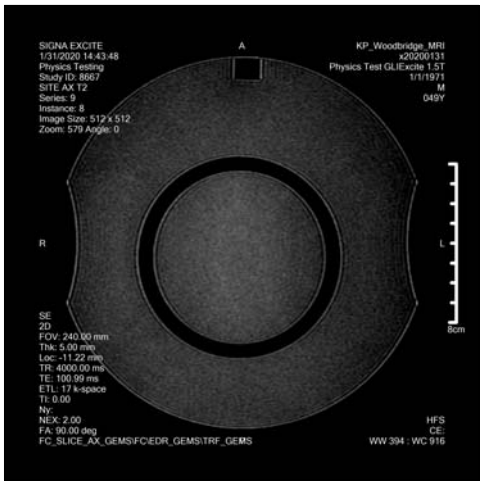

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 3
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1019 : WC 509

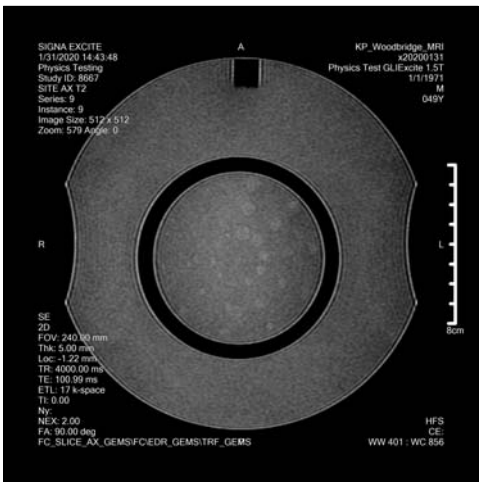

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 4
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1004 : WC 502


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 5
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1181 : WC 590

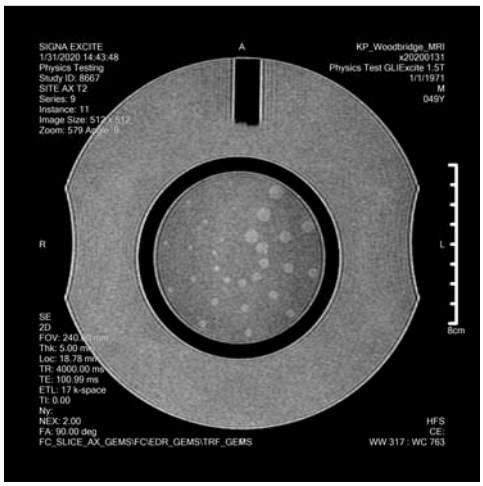

SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 6
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 1010 : WC 505


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 7
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 920 : WC 746


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 8
Image Size: 512 x 512
Zoom: 579 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
TR: 4000.00 ms
TE: 100.99 ms
ETL: 17 k-space
TI: 0.00
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 394 : WC 916


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 9
Image Size: 512 x 512
Zoom: 579 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
TR: 4000.00 ms
TE: 100.99 ms
ETL: 17 k-space
TI: 0.00
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 401 : WC 856


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 10
Image Size: 512 x 512
Zoom: 579 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: 8.78 mm
TR: 4000.00 ms
TE: 100.99 ms
ETL: 17 k-space
TI: 0.00
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 296 : WC 777


SIGNA EXCITE
1/31/2020 14:43:48
Physics Testing
Study ID: 8667
SITE AX T2
Series: 9
Instance: 11
Image Size: 512 x 512
Zoom: 579 Angle: 0
KP_Woodbridge_MRI
x20200131
Physics Test GLIExcite 1.5T
1/1/1971
M
049Y
A
R
L
8cm
SE
2D
FOV: 240.00 mm
Thk: 5.00 mm
Loc: 18.78 mm
TR: 4000.00 ms
TE: 100.99 ms
ETL: 17 k-space
TI: 0.00
NEX: 2.00
FA: 90.00 deg
FC_SLICE_AX_GEMS\FC\EDR_GEMS\TRF_GEMS
HFS
WW 317 : WC 763