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	calf_localizer_left calf_UHR calf_mDixon calf_MTR_ON	GRE_FA12
	call_MTR_ON calf_MTR_OFF calf_MTsat_pdw calf_MTsat_t1w	
	calf_PDW calf_T1W calf_B1map	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_localizer\_right

TA: 37 sec Coil Selection: Auto Voxel Size: 0.5×0.5×3.0 mm³ Acc:: None Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	On
Graphic segment	All Segments
Inline Movie	Off

### Routine

Slice Group	1
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Phase Oversampling	25 %
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	7.7 ms
TE	3.67 ms
Averages	1
Concatenations	19
AutoAlign	Knee > Standard
Coil Elements	18K

#### **Contrast - Common**

TR	7.7 ms
TE	3.67 ms
TD	0.00 ms
MTC	Off
Magn. Preparation	None
Flip Angle	20 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1

### **Contrast - Dynamic**

Multiple Series	Each Measurement
Resolution - Common	
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Interpolation	On

### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	On
Distortion Correction	2D
Normalize	Off
Image Filter	Off

### **Geometry - Common**

Slice Group         1           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential		
Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slice Group	1
Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices Group         3           Slices 13         Distance Factor           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Position	R25.0 A36.0 H0.0 mm
Slice Group         2           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Orientation	Sagittal
Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Phase Encoding Dir.	A >> P
Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slice Group	2
Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slices	13
Orientation Sagittal Phase Encoding Dir. A >> P  Slice Group 3 Slices 13 Distance Factor 0 % Position R25.0 A36.0 H0.0 mm Orientation Sagittal Phase Encoding Dir. A >> P  Phase Oversampling 25 % FoV Read 280 mm FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Position	R25.0 A36.0 H0.0 mm
Slice Group         3           Slices         13           Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Orientation	Sagittal
Slices	Phase Encoding Dir.	A >> P
Distance Factor         0 %           Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slice Group	3
Position         R25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Slices	13
Orientation Sagittal Phase Encoding Dir. A >> P  Phase Oversampling 25 % FoV Read 280 mm FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           Multi-Slice Mode         Sequential	Position	R25.0 A36.0 H0.0 mm
Phase Oversampling 25 % FoV Read 280 mm FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	Orientation	Sagittal
FoV Read 280 mm FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	Phase Encoding Dir.	A >> P
FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	Phase Oversampling	25 %
Slice Thickness 3.0 mm TR 7.7 ms Multi-Slice Mode Sequential	FoV Read	280 mm
TR 7.7 ms Multi-Slice Mode Sequential	FoV Phase	100.0 %
Multi-Slice Mode Sequential	Slice Thickness	3.0 mm
	TR	7.7 ms
1	Multi-Slice Mode	Sequential
Series Interleaved	Series	Interleaved
Concatenations 19	Concatenations	19

# **Geometry - AutoAlign**

•	
Slice Group	1
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3

# **Geometry - AutoAlign**

Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
AutoAlign	Knee > Standard
Initial Position	R25.0 A36.0 H0.0
R	25.0 mm
Α	36.0 mm
Н	0.0 mm
Initial Orientation	Transversal
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	H >> F
Coil Combination	Adaptive Combine
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Tune up
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# **System - Adjust Volume**

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

### Physio - Signal

1st Signal/Mode	None	
TR	7.7 ms	
Segments	1	

### Physio - Signal

Concatenations	19
Concatenations	19

# Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	280 mm	
FoV Phase	100.0 %	
Phase Resolution	75 %	
Dynamic Mode	Standard	

# **Physio - PACE**

Resp. Control	Off
Concatenations	19

### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	3.67 ms
TR	7 7 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

### Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
TTP PEI MIP Time	Off
Measurements	1

# **Inline - Composing**

Inline Composing	Off	
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# Inline - MapIt

MapIt	None
Flip Angle	20 deg
Measurements	1
Contrasts	1
TE	3.67 ms
TR	7.7 ms
Save Original Images	On

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 1

Sequence Name	fl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Normal
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	320 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_localizer\_left

TA: 37 sec Coil Selection: Auto Voxel Size: 0.5×0.5×3.0 mm³ Acc:: None Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	On
Graphic segment	All Segments
Inline Movie	Off

### Routine

Slice Group         1           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms           TE         3.67 ms		
Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Slice Group	1
Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices Group         3           Slices 13         Distance Factor           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Position	L25.0 A36.0 H0.0 mm
Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Orientation	Sagittal
Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Phase Encoding Dir.	A >> P
Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Slice Group	2
Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Position	L25.0 A36.0 H0.0 mm
Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Orientation	Sagittal
Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Phase Encoding Dir.	A >> P
Distance Factor 0 % Position L25.0 A36.0 H0.0 mm Orientation Sagittal Phase Encoding Dir. A >> P  Phase Oversampling 25 % FoV Read 280 mm FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms	Slice Group	3
Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Position	L25.0 A36.0 H0.0 mm
Phase Oversampling         25 %           FoV Read         280 mm           FoV Phase         100.0 %           Slice Thickness         3.0 mm           TR         7.7 ms	Orientation	Sagittal
FoV Read       280 mm         FoV Phase       100.0 %         Slice Thickness       3.0 mm         TR       7.7 ms	Phase Encoding Dir.	A >> P
FoV Phase 100.0 % Slice Thickness 3.0 mm TR 7.7 ms	Phase Oversampling	25 %
Slice Thickness 3.0 mm TR 7.7 ms	FoV Read	280 mm
TR 7.7 ms	FoV Phase	100.0 %
1	Slice Thickness	3.0 mm
TE 3.67 ms	TR	7.7 ms
	TE	3.67 ms
Averages 1	Averages	1
Concatenations 19	Concatenations	19
AutoAlign Knee > Standard	AutoAlign	Knee > Standard
Coil Elements 18K	Coil Elements	18K

### **Contrast - Common**

TR	7.7 ms
TE	3.67 ms
TD	0.00 ms
MTC	Off
Magn. Preparation	None
Flip Angle	20 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1

### **Contrast - Dynamic**

Multiple Series	Each Measurement
Resolution - Common	
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Interpolation	On

### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	On
Distortion Correction	2D
Normalize	Off
Image Filter	Off

### **Geometry - Common**

Slice Group         1           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Phase Oversampling         25 %		
Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Slice Group	1
Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Position	L25.0 A36.0 H0.0 mm
Slice Group         2           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Orientation	Sagittal
Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Phase Encoding Dir.	A >> P
Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Slice Group	2
Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Slices	13
Orientation         Sagittal           Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Distance Factor	0 %
Phase Encoding Dir.         A >> P           Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Position	L25.0 A36.0 H0.0 mm
Slice Group         3           Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Orientation	Sagittal
Slices         13           Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Phase Encoding Dir.	A >> P
Distance Factor         0 %           Position         L25.0 A36.0 H0.0 mm           Orientation         Sagittal           Phase Encoding Dir.         A >> P	Slice Group	3
Position L25.0 A36.0 H0.0 mm Orientation Sagittal Phase Encoding Dir. A >> P	Slices	13
Orientation Sagittal Phase Encoding Dir. A >> P	Distance Factor	0 %
Phase Encoding Dir. A >> P	Position	L25.0 A36.0 H0.0 mm
That I have a second and a second a sec	Orientation	Sagittal
Phase Oversampling 25 %	Phase Encoding Dir.	A >> P
	Phase Oversampling	25 %
FoV Read 280 mm	FoV Read	280 mm
FoV Phase 100.0 %	FoV Phase	100.0 %
Slice Thickness 3.0 mm	Slice Thickness	3.0 mm
TR 7.7 ms	TR	7.7 ms
Multi-Slice Mode Sequential	Multi-Slice Mode	Sequential
Series Interleaved	Series	Interleaved
Concatenations 19	Concatenations	19

# **Geometry - AutoAlign**

Slice Group	1
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3

# **Geometry - AutoAlign**

Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
AutoAlign	Knee > Standard
Initial Position	L25.0 A36.0 H0.0
L	25.0 mm
Α	36.0 mm
Н	0.0 mm
Initial Orientation	Transversal
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	H >> F
Coil Combination	Adaptive Combine
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Tune up
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# **System - Adjust Volume**

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

### Physio - Signal

1st Signal/Mode	None	
TR	7.7 ms	
Segments	1	

# Physio - Signal

Concatenations	19
	<del>-</del>

# Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	280 mm	
FoV Phase	100.0 %	
Phase Resolution	75 %	
Dynamic Mode	Standard	

# **Physio - PACE**

Resp. Control	Off	
Concatenations	19	

### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

### **Inline - Subtraction**

Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	3.67 ms
TR	7.7 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

### Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

Inline Composing	Off
------------------	-----

# Inline - MapIt

MapIt	None
Flip Angle	20 deg
Measurements	1
Contrasts	1
TE	3.67 ms
TR	7.7 ms
Save Original Images	On

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 1

Sequence Name	fl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Normal
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	320 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_UHR GRE\_FA12

TA: 6:41 min Coil Selection: Auto Voxel Size: 0.2×0.2×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	23.0 ms
TE	7.50 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K
-	

### **Contrast - Common**

TR	23.0 ms
TE	7.50 ms
MTC	Off
Magn. Preparation	None
Flip Angle	12 deg
Fat-Water Contrast	Fast Water Excitation
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	1024
Phase Resolution	75 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	23.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

#### System - Miscellaneous

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	23.0 ms
Segments	1
Concatenations	1

# Physio - Cardiac

Tagging	None
Fat-Water Contrast	Fast Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

# Physio - PACE

Resp. Control	Off
Concatenations	1

### Inline - Liver

Liver Registration	Off
Save Original Images	On

### **Inline - Subtraction**

Subtract	Off	

#### **Inline - Subtraction**

Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	7.50 ms
TR	23.0 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

Inline Composing	Off	

# Inline - MapIt

MapIt	None
Flip Angle	12 deg
Measurements	1
Contrasts	1
TE	7.50 ms
TR	23.0 ms
Save Original Images	On

### Sequence - Part 1

Sequence Name	fl_rs
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	Slice
Bandwidth	110 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_mDixon

TA: 1:08 min Coil Selection: Auto Voxel Size: 1.3×1.3×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

# **Contrast - Common**

Contrast - Common	
TR	20.0 ms
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	6 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	6
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	128
Phase Resolution	100 %
Slice Resolution	100 %
Interpolation	Off

### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Off
Elliptical Scanning	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

### **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

### **System - Miscellaneous**

0.10.1.4	D ( )
Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
A >> P R >> L F >> H	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

,		
Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	160 mm	
FoV Phase	100.0 %	
Phase Resolution	100 %	
Dynamic Mode	Standard	

### **Physio - PACE**

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	6
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
TR	20.0 ms

# Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# **Inline - Composing**

# Inline - MapIt

MapIt	None
Flip Angle	6 deg
Measurements	1
Contrasts	6
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
TR	20.0 ms
Save Original Images	On

### Sequence - Part 1

Sequence Name	fl
Ocquerice Name	11

# Sequence - Part 1

Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Readout Mode	Monopolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Flow Compensation 4	None
Flow Compensation 5	None
Flow Compensation 6	None
Bandwidth 1	710 Hz/Px
Bandwidth 2	710 Hz/Px
Bandwidth 3	710 Hz/Px
Bandwidth 4	710 Hz/Px
Bandwidth 5	710 Hz/Px
Bandwidth 6	710 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_MTR\_ON

TA: 3:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
MTC	On
Magn. Preparation	None
Flip Angle	10 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	3
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

# **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256

#### **Resolution - Common**

Phase Resolution	75 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

•	
Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	41.0 ms
Segments	1
Concatenations	1

# Physio - Cardiac

Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

#### Physio - PACE

Resp. Control	Off	
Concatenations	1	

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	3
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TR	41.0 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

Inline Composing Off	Inline Composing	Off
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# Inline - MapIt

MapIt	None
Flip Angle	10 deg
Measurements	1
Contrasts	3
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TR	41.0 ms
Save Original Images	On

# Sequence - Part 1

Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 1

Bandwidth 3	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_MTR\_OFF

TA: 3:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### Contrast - Common

TE 1 5.10 ms TE 2 10.34 ms TE 3 15.66 ms	Contrast - Common	
TE 2       10.34 ms         TE 3       15.66 ms         TE 4       20.98 ms         TE 5       26.30 ms         TE 6       31.62 ms         MTC       Off         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off         Contrasts       6         SWI       Off	TR	41.0 ms
TE 3       15.66 ms         TE 4       20.98 ms         TE 5       26.30 ms         TE 6       31.62 ms         MTC       Off         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off         Contrasts       6         SWI       Off	TE 1	5.10 ms
TE 4       20.98 ms         TE 5       26.30 ms         TE 6       31.62 ms         MTC       Off         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off         Contrasts       6         SWI       Off	TE 2	10.34 ms
TE 5       26.30 ms         TE 6       31.62 ms         MTC       Off         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off         Contrasts       6         SWI       Off	TE 3	15.66 ms
TE 6 31.62 ms MTC Off Magn. Preparation None Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 6 SWI Off	TE 4	20.98 ms
MTC Off Magn. Preparation None Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 6 SWI Off	TE 5	26.30 ms
Magn. Preparation  Flip Angle  Fat-Water Contrast  Dark Blood  Contrasts  SWI  None  10 deg  Water Excitation  Off  Off  Off	TE 6	31.62 ms
Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 6 SWI Off	MTC	Off
Fat-Water Contrast Water Excitation  Dark Blood Off  Contrasts 6  SWI Off	Magn. Preparation	None
Dark Blood Off Contrasts 6 SWI Off	Flip Angle	10 deg
Contrasts 6 SWI Off	Fat-Water Contrast	Water Excitation
SWI Off	Dark Blood	Off
	Contrasts	6
Reconstruction Magn./Phase	SWI	Off
	Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

### **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

0.10.1.4	D ( )
Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
A >> P R >> L F >> H	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	41.0 ms
Segments	1
Concatenations	1

# Physio - Cardiac

Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

### **Physio - PACE**

Resp. Control	Off
Concatenations	1

### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

#### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

# Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	6
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
TR	41.0 ms

# Inline - MIP

·	
MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# **Inline - Composing**

# Inline - MapIt

MapIt	None
Flip Angle	10 deg
Measurements	1
Contrasts	6
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
TR	41.0 ms
Save Original Images	On

### Sequence - Part 1

# Sequence - Part 1

Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Flow Compensation 4	None
Flow Compensation 5	None
Flow Compensation 6	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Bandwidth 3	220 Hz/Px
Bandwidth 4	220 Hz/Px
Bandwidth 5	220 Hz/Px
Bandwidth 6	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off	٦
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_MTsat\_pdw

TA: 1:36 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
MTC	Off
Magn. Preparation	None
Flip Angle	5 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	2
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %

#### **Resolution - Common**

Interpolation	Off	
Interpolation	Oli	

### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm

# **Geometry - Tim Planning Suite**

Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L F >> H	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm	
Excitation	Slab-sel.	

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

# Physio - PACE

Resp. Control	Off
Concatenations	1

### Inline - Liver

Liver Registration	Off	
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#### Inline - Liver

Save Original Images

Inline - Subtraction		
Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

On

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms

# Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

# Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

		_
Inline Composing	Off	
Tinline Composina	OII	

# Inline - MapIt

MapIt	None	
Flip Angle	5 deg	
Measurements	1	
Contrasts	2	
TE 1	5.10 ms	
TE 2	10.34 ms	
TR	20.0 ms	
Save Original Images	On	

### Sequence - Part 1

Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_MTsat\_t1w

TA: 1:36 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
MTC	Off
Magn. Preparation	None
Flip Angle	22 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	2
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %

#### **Resolution - Common**

Interpolation	Off	
Interpolation	Oli	

### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm

# **Geometry - Tim Planning Suite**

Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal Coronal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

<b>,</b>	
Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

# Physio - PACE

Resp. Control	Off
Concatenations	1

### Inline - Liver

Liver Registration	Off	
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#### Inline - Liver

Save Original Images

Inline - Subtraction		
Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

On

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms

# Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

# Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

Latha a Carana a chain	0"
Inline Composing	( )ff

# Inline - MapIt

MapIt	None
Flip Angle	22 deg
Measurements	1
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms
Save Original Images	On

### Sequence - Part 1

_	
Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_PDW

TA: 1:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further	On
preparation	
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
TE	5.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

TR	12.0 ms
TE	5.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	4 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

### **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

### **Resolution - Common**

FoV Read	160 mm	
FoV Phase	100.0 %	
Slice Thickness	3.0 mm	
Base Resolution	256	
Phase Resolution	100 %	
Slice Resolution	100 %	
Interpolation	Off	

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

	=	
Set-n-Go Protocol	Off	
Table Position	0 mm	
Table Position	Н	
Inline Composina	Off	

#### System - Miscellaneous

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

### **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

### System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	12.0 ms
Segments	1
Concatenations	1

# Physio - Cardiac

Tagging	None
Fat-Water Contrast	Standard
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	100 %
Dynamic Mode	Standard

# Physio - PACE

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

### **Inline - Subtraction**

Subtract	Off	
----------	-----	--

#### **Inline - Subtraction**

Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	5.10 ms
TR	12.0 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# **Inline - Composing**

Inline Composing	Off	

# Inline - MapIt

MapIt	None
Flip Angle	4 deg
Measurements	1
Contrasts	1
TE	5.10 ms
TR	12.0 ms
Save Original Images	On

### Sequence - Part 1

Sequence Name	fl_r
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	On
Bandwidth	420 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Intro	oduction	On
RF :	Spoiling	On
Aco	ustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_T1W

TA: 1:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
TE	5.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

TR	12.0 ms
TE	5.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	17 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

### **Resolution - Common**

FoV Read	160 mm	
FoV Phase	100.0 %	
Slice Thickness	3.0 mm	
Base Resolution	256	
Phase Resolution	100 %	
Slice Resolution	100 %	
Interpolation	Off	

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

# **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

#### System - Miscellaneous

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

### **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

### System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	12.0 ms
Segments	1
Concatenations	1

# Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	160 mm	
FoV Phase	100.0 %	
Phase Resolution	100 %	
Dynamic Mode	Standard	

# Physio - PACE

Resp. Control	Off	
Concatenations	1	

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

### **Inline - Subtraction**

Subtract	Off	
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#### **Inline - Subtraction**

Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	5.10 ms
TR	12.0 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# Inline - Composing

Inline Composing	Off	

# Inline - MapIt

MapIt	None
Flip Angle	17 deg
Measurements	1
Contrasts	1
TE	5.10 ms
TR	12.0 ms
Save Original Images	On

### Sequence - Part 1

-	
Sequence Name	fl_r
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	On
Bandwidth	420 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off
Allowed Delay	0 s

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_B1map

TA: 25 sec Coil Selection: Auto Voxel Size: 1.3×1.3×6.0 mm³ Acc:: None Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### Routine

Slice Group	1
Slices	20
Distance Factor	100 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	11530.0 ms
TE	2.03 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	11530.0 ms
TE	2.03 ms
Magn. Preparation	None
Flip Angle	8 deg
Fat-Water Contrast	Standard
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
Base Resolution	128
Phase Resolution	100 %
Interpolation	Off

### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Allowed

### **Resolution - Filter**

#### **Resolution - Filter**

Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

### **Geometry - Common**

Slice Group	1
Slices	20
Distance Factor	100 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	11530.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

# Geometry - AutoAlign

Slice Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard	
B0 Shim	Tune up	
B1 Shim	TrueForm	
Adjustment Tolerance	Auto	
Adjust with Body Coil	Off	
Confirm Frequency	Never	
Assume Silicone	Off	

# System - Adjust Volume

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

# Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
TE	2.03 ms
TR	11530.0 ms

# Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

# Inline - Composing

	0"
Inline Composina	Off

# Sequence - Part 1

Sequence Name	tfl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Low SAR
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	490 Hz/Px
Echo Spacing	4.50 ms
Asymmetric Echo	Allowed
Turbo Factor	128

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	

SAR ASSISTANT OTT
-------------------

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\thigh\_ep2d\_diff20\_new

TA: 8:46 min Coil Selection: Auto Voxel Size: 1.3×1.3×6.0 mm³ Acc:: 3 Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

### **Routine**

Slice Group	1
Slices	16
Distance Factor	0 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	4000.0 ms
TE	93.00 ms
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	4000.0 ms
TE	93.00 ms
MTC	Off
Magn. Preparation	None
Fat-Water Contrast	SPAIR
Fat Saturation	Strong
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Multiple Series	Off
Delay in TR	0.00 ms

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
Base Resolution	128
Phase Resolution	100 %
Interpolation	Off

### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	EPI/Separate
Acceleration Factor PE	3
Reference Lines PE	78
Phase Partial Fourier	6/8

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	Off
Normalize	Off

### **Geometry - Common**

Slice Group	1
Slices	16
Distance Factor	0 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	4000.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

#### Geometry - AutoAlign

- · · · · · · · · · · · · · · · · · · ·	
Slice Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Navigator**

### **Geometry - Saturation**

<b>I</b>		
Special Saturation	None	
Looeciai oaturation	NONE	

### **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

### **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

# **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm

# System - Adjustments

Adjustment Tolerance	Auto	
Adjust with Body Coil	Off	
Confirm Frequency	Never	
Assume Silicone	Off	

# **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P R >> L F >> H	160 mm
R >> L	160 mm
F >> H	96 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Standard

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	4000.0 ms
Concatenations	1

# Physio - PACE

Resp. Control	Off
Concatenations	1

# Diff

Diffusion Mode	MDDW
Diff. Directions	20
Diffusion Scheme	Bipolar
Diff. Weightings	2
b-value 1	0 s/mm <sup>2</sup>
b-value 2	800 s/mm <sup>2</sup>
Averages 1	6
Averages 2	6
Dynamic Field Correction	Off
Invert Gray Scale	Off
Diff. Weighted Images	On
Trace Weighted Images	On
Tensor	On
FA Maps	On
ADC Maps	On
Exponential ADC Maps	Off
ADC Noise Threshold	6
Calculated Image	Off

# Sequence - Part 1

ocquemos runti		
Sequence Name	epse	
Excitation	Standard	
RF Pulse Type	Normal	
Gradient Mode	Fast	
Bandwidth	1028 Hz/Px	
Echo Spacing	1.10 ms	
Free Echo Spacing	Off	
Optimization	None	

# Sequence - Part 1

EPI Factor	128	
Sequence - Part 2		
Introduction	On	
Phase Correction	Internal	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_localizer\_right

TA: 37 sec Coil Selection: Auto Voxel Size: 0.5×0.5×3.0 mm³ Acc:: None Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	On
Graphic segment	All Segments
Inline Movie	Off

### Routine

Slice Group	1
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Phase Oversampling	25 %
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	7.7 ms
TE	3.67 ms
Averages	1
Concatenations	19
AutoAlign	Knee > Standard
Coil Elements	18K

#### **Contrast - Common**

TR	7.7 ms
TE	3.67 ms
TD	0.00 ms
MTC	Off
Magn. Preparation	None
Flip Angle	20 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1

### **Contrast - Dynamic**

Multiple Series	Each Measurement	
Resolution - Common		
FoV Read	280 mm	
FoV Phase	100.0 %	
Slice Thickness	3.0 mm	
Base Resolution	256	
Phase Resolution	75 %	
Interpolation	On	

### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	On
Distortion Correction	2D
Normalize	Off
Image Filter	Off

#### **Geometry - Common**

Geometry - Common	
Slice Group	1
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3
Slices	13
Distance Factor	0 %
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Phase Oversampling	25 %
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	7.7 ms
Multi-Slice Mode	Sequential
Series	Interleaved
Concatenations	19

# **Geometry - AutoAlign**

Slice Group	1
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3

### **Geometry - AutoAlign**

Position	R25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
AutoAlign	Knee > Standard
Initial Position	R25.0 A36.0 H0.0
R	25.0 mm
Α	36.0 mm
Н	0.0 mm
Initial Orientation	Transversal
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

# **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	H >> F
Coil Combination	Adaptive Combine
Matrix Optimization	Off

# **System - Adjustments**

A II	0
Adjustment Strategy	Standard
B0 Shim	Tune up
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# System - Adjust Volume

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

### Physio - Signal

1st Signal/Mode	None	
TR	7.7 ms	
Segments	1	

### Physio - Signal

Concatenations	19
Concatenations	19

# Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	280 mm	
FoV Phase	100.0 %	
Phase Resolution	75 %	
Dynamic Mode	Standard	

# **Physio - PACE**

Resp. Control	Off	
Concatenations	19	

### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	3.67 ms
TR	7.7 ms

### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

# Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

# **Inline - Composing**

Inline Composing	Off
------------------	-----

# Inline - MapIt

MapIt	None
Flip Angle	20 deg
Measurements	1
Contrasts	1
TE	3.67 ms
TR	7.7 ms
Save Original Images	On

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 1

Sequence Name	fl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Normal
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	320 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

# \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_localizer\_left

TA: 37 sec Coil Selection: Auto Voxel Size: 0.5×0.5×3.0 mm³ Acc:: None Rel. SNR: 1.00

### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	On
Graphic segment	All Segments
Inline Movie	Off

### Routine

Slice Group	1
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Phase Oversampling	25 %
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	7.7 ms
TE	3.67 ms
Averages	1
Concatenations	19
AutoAlign	Knee > Standard
Coil Elements	18K

#### **Contrast - Common**

TR	7.7 ms
TE	3.67 ms
TD	0.00 ms
MTC	Off
Magn. Preparation	None
Flip Angle	20 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magnitude

# **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1

### **Contrast - Dynamic**

Multiple Series	Each Measurement	
Resolution - Common		
FoV Read	280 mm	
FoV Phase	100.0 %	
Slice Thickness	3.0 mm	
Base Resolution	256	
Phase Resolution	75 %	
Interpolation	On	

### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Off

### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	On
Distortion Correction	2D
Normalize	Off
Image Filter	Off

#### **Geometry - Common**

- Committee	
Slice Group	1
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3
Slices	13
Distance Factor	0 %
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Phase Oversampling	25 %
FoV Read	280 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	7.7 ms
Multi-Slice Mode	Sequential
Series	Interleaved
Concatenations	19
·	<u> </u>

# **Geometry - AutoAlign**

Slice Group	1
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	2
Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
Slice Group	3

## **Geometry - AutoAlign**

Position	L25.0 A36.0 H0.0 mm
Orientation	Sagittal
Phase Encoding Dir.	A >> P
AutoAlign	Knee > Standard
Initial Position	L25.0 A36.0 H0.0
L	25.0 mm
Α	36.0 mm
Н	0.0 mm
Initial Orientation	Transversal
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	H >> F
Coil Combination	Adaptive Combine
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Tune up
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## **System - Adjust Volume**

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

#### Physio - Signal

1st Signal/Mode	None	
TR	7.7 ms	
Segments	1	

#### Physio - Signal

Concatenations	19
Concatenations	19

## Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	280 mm	
FoV Phase	100.0 %	
Phase Resolution	75 %	
Dynamic Mode	Standard	

## **Physio - PACE**

Resp. Control	Off	
Concatenations	19	

#### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

#### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	3.67 ms
TR	7 7 ms

## Inline - MIP

MIP Sag	Off	
MIP Cor	Off	
MIP Tra	Off	
MIP Time	Off	
Radial MIP	Off	
Save Original Images	On	
MPR Sag	Off	
MPR Cor	Off	
MPR Tra	Off	

#### Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
TTP PEI MIP Time	Off
Measurements	1

## Inline - Composing

Inline Composing	Off	
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## Inline - MapIt

MapIt	None
Flip Angle	20 deg
Measurements	1
Contrasts	1
TE	3.67 ms
TR	7.7 ms
Save Original Images	On

# Sequence - Part 1

Sequence Name	fl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Normal
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	320 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_UHR GRE\_FA12

TA: 6:41 min Coil Selection: Auto Voxel Size: 0.2×0.2×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further	On
preparation	
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	23.0 ms
TE	7.50 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	23.0 ms
TE	7.50 ms
MTC	Off
Magn. Preparation	None
Flip Angle	12 deg
Fat-Water Contrast	Fast Water Excitation
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

#### **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm	
FoV Phase	100.0 %	
Slice Thickness	3.0 mm	
Base Resolution	1024	
Phase Resolution	75 %	
Slice Resolution	100 %	
Interpolation	Off	

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	23.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

#### System - Miscellaneous

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

#### **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

#### **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	23.0 ms
Segments	1
Concatenations	1

## Physio - Cardiac

Tagging	None
Fat-Water Contrast	Fast Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

## Physio - PACE

Resp. Control	Off	
Concatenations	1	

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

#### **Inline - Subtraction**

Subtract	Off
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#### **Inline - Subtraction**

Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	7.50 ms
TR	23.0 ms

#### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

## **Inline - Composing**

Inline Composing	Off	

## Inline - MapIt

MapIt	None
Flip Angle	12 deg
Measurements	1
Contrasts	1
TE	7.50 ms
TR	23.0 ms
Save Original Images	On

## Sequence - Part 1

Sequence Name	fl_rs
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	Slice
Bandwidth	110 Hz/Px
Asymmetric Echo	Allowed
Segments	1

#### Sequence - Part 2

Intro	oduction	On
RF :	Spoiling	On
Aco	ustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_mDixon

TA: 1:08 min Coil Selection: Auto Voxel Size: 1.3×1.3×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Face a	
Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

### **Contrast - Common**

Jona Jona Jona Jona Jona Jona Jona Jona	
TR	20.0 ms
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	6 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	6
SWI	Off
Reconstruction	Magn./Phase

## **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	128
Phase Resolution	100 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Off
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

#### **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

1 Hydro Garaiad	
Tagging	None
Fat-Water Contrast	Standard
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	100 %
Dynamic Mode	Standard

#### **Physio - PACE**

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

#### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	6
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
TR	20.0 ms

## Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

## **Inline - Composing**

## Inline - MapIt

MapIt	None
Flip Angle	6 deg
Measurements	1
Contrasts	6
TE 1	2.10 ms
TE 2	5.10 ms
TE 3	8.10 ms
TE 4	11.10 ms
TE 5	14.10 ms
TE 6	17.10 ms
TR	20.0 ms
Save Original Images	On

Sequence Name	fl
Seducite Name	II .

# Sequence - Part 1

Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Readout Mode	Monopolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Flow Compensation 4	None
Flow Compensation 5	None
Flow Compensation 6	None
Bandwidth 1	710 Hz/Px
Bandwidth 2	710 Hz/Px
Bandwidth 3	710 Hz/Px
Bandwidth 4	710 Hz/Px
Bandwidth 5	710 Hz/Px
Bandwidth 6	710 Hz/Px
Asymmetric Echo	Off
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_MTR\_ON

TA: 3:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TE 1       5.10 ms         TE 2       10.34 ms         TE 3       15.66 ms         MTC       On         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off	Contract Common	
TE 2       10.34 ms         TE 3       15.66 ms         MTC       On         Magn. Preparation       None         Flip Angle       10 deg         Fat-Water Contrast       Water Excitation         Dark Blood       Off         Contrasts       3         SWI       Off	TR	41.0 ms
TE 3 15.66 ms MTC On Magn. Preparation None Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 3 SWI Off	TE 1	5.10 ms
MTC On Magn. Preparation None Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 3 SWI Off	TE 2	10.34 ms
Magn. Preparation  Flip Angle Fat-Water Contrast Dark Blood Contrasts SWI  None 10 deg Water Excitation Off Off Off Off	TE 3	15.66 ms
Flip Angle 10 deg Fat-Water Contrast Water Excitation Dark Blood Off Contrasts 3 SWI Off	MTC	On
Fat-Water Contrast Water Excitation  Dark Blood Off  Contrasts 3  SWI Off	Magn. Preparation	None
Dark Blood Off Contrasts 3 SWI Off	Flip Angle	10 deg
Contrasts 3 SWI Off	Fat-Water Contrast	Water Excitation
SWI Off	Dark Blood	Off
	Contrasts	3
Reconstruction Magn./Phase	SWI	Off
	Reconstruction	Magn./Phase

#### **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

## **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256

#### **Resolution - Common**

Phase Resolution	75 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

#### **Geometry - Common**

•	
Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	41.0 ms
Segments	1
Concatenations	1

## Physio - Cardiac

Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

#### Physio - PACE

Resp. Control	Off	
Concatenations	1	

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

#### **Inline - Subtraction**

Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	3
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TR	41.0 ms

#### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### Inline - Soft Tissue

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

## Inline - Composing

Inline Composing	Off
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## Inline - MapIt

MapIt	None
Flip Angle	10 deg
Measurements	1
Contrasts	3
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TR	41.0 ms
Save Original Images	On

Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px

## SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 1

Bandwidth 3	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off	
Allowed Delay	0 s	

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_MTR\_OFF

TA: 3:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### Contrast - Common

Contrast - Common	
TR	41.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
MTC	Off
Magn. Preparation	None
Flip Angle	10 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	6
SWI	Off
Reconstruction	Magn./Phase

## **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	41.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

#### **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## System - Adjust Volume

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L F >> H	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	41.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

- Tryoro Garanao	
Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

#### **Physio - PACE**

Resp. Control	Off
Concatenations	1

### Inline - Liver

Liver Registration	Off
Save Original Images	On

#### **Inline - Subtraction**

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	6
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
TR	41.0 ms

## Inline - MIP

MIP Sag	Off	
MIP Cor	Off	
MIP Tra	Off	
MIP Time	Off	
Radial MIP	Off	
Save Original Images	On	
MPR Sag	Off	
MPR Cor	Off	
MPR Tra	Off	

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

## **Inline - Composing**

## Inline - MapIt

MapIt	None
Flip Angle	10 deg
Measurements	1
Contrasts	6
TE 1	5.10 ms
TE 2	10.34 ms
TE 3	15.66 ms
TE 4	20.98 ms
TE 5	26.30 ms
TE 6	31.62 ms
TR	41.0 ms
Save Original Images	On

Sequence Name fl
------------------

# Sequence - Part 1

Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Flow Compensation 3	None
Flow Compensation 4	None
Flow Compensation 5	None
Flow Compensation 6	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Bandwidth 3	220 Hz/Px
Bandwidth 4	220 Hz/Px
Bandwidth 5	220 Hz/Px
Bandwidth 6	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_MTsat\_pdw

TA: 1:36 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
MTC	Off
Magn. Preparation	None
Flip Angle	5 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	2
SWI	Off
Reconstruction	Magn./Phase

## **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %

#### **Resolution - Common**

Interpolation	Off	
Interpolation	Oli	

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm

## **Geometry - Tim Planning Suite**

Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm	
Excitation	Slab-sel.	

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

## Physio - PACE

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off	
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#### Inline - Liver

Save Original Images

Inline - Subtraction		
Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms

## Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

## Inline - Soft Tissue

Wash-in	Off	
Wash-out	Off	
TTP	Off	
PEI	Off	
MIP Time	Off	
Measurements	1	

## **Inline - Composing**

Inline Composing	Off

## Inline - MapIt

MapIt	None	
Flip Angle	5 deg	
Measurements	1	
Contrasts	2	
TE 1	5.10 ms	
TE 2	10.34 ms	
TR	20.0 ms	
Save Original Images	On	

_	
Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

## SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_MTsat\_t1w

TA: 1:36 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	20.0 ms
TE 1	5.10 ms
TE 2	10.34 ms
MTC	Off
Magn. Preparation	None
Flip Angle	22 deg
Fat-Water Contrast	Water Excitation
Dark Blood	Off
Contrasts	2
SWI	Off
Reconstruction	Magn./Phase

## **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	75 %
Slice Resolution	100 %

#### **Resolution - Common**

Interpolation	Off	
Interpolation	Oli	

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off	
Elliptical Filter	Off	
Distortion Correction	2D	
Normalize	Off	
Image Filter	Off	

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	20.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## **Geometry - AutoAlign**

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

# **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm

## **Geometry - Tim Planning Suite**

Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

## **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm	
Excitation	Slab-sel.	

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	20.0 ms
Segments	1
Concatenations	1

#### Physio - Cardiac

<b>,</b>	
Tagging	None
Fat-Water Contrast	Water Excitation
Magn. Preparation	None
Dark Blood	Off
FoV Read	160 mm
FoV Phase	100.0 %
Phase Resolution	75 %
Dynamic Mode	Standard

## Physio - PACE

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off	
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#### Inline - Liver

Save Original Images

Inline - Subtraction		
Subtract	Off	
Measurements	1	
StdDev	Off	
Save Original Images	On	

On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms

## Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

## Inline - Soft Tissue

Wash-in	Off	
Wash-out	Off	
TTP	Off	
PEI	Off	
MIP Time	Off	
Measurements	1	

## **Inline - Composing**

Inline Composing	Off
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## Inline - MapIt

MapIt	None
Flip Angle	22 deg
Measurements	1
Contrasts	2
TE 1	5.10 ms
TE 2	10.34 ms
TR	20.0 ms
Save Original Images	On

Sequence Name	fl
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Normal
Readout Mode	Bipolar
Gradient Mode	Fast
Flow Compensation 1	None
Flow Compensation 2	None
Bandwidth 1	220 Hz/Px
Bandwidth 2	220 Hz/Px
Asymmetric Echo	Allowed
Segments	1

# SIEMENS MAGNETOM Vida-XT-128 Numaris/X VA20A-04ML

# Sequence - Part 2

Introduction	On
RF Spoiling	On
Acoustic noise reduction	Off

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_PDW

TA: 1:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further	On
preparation	
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
TE	5.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	12.0 ms
TE	5.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	4 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

#### **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	100 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
Α	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

# **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

#### System - Miscellaneous

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

#### **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

#### **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P R >> L F >> H	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

# System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	12.0 ms
Segments	1
Concatenations	1

## Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	160 mm	
FoV Phase	100.0 %	
Phase Resolution	100 %	
Dynamic Mode	Standard	

## Physio - PACE

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off
Save Original Images	On

#### **Inline - Subtraction**

Subtract	Off	
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#### **Inline - Subtraction**

Measurements	1	
StdDev	Off	
Save Original Images	On	

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	5.10 ms
TR	12.0 ms

#### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

### **Inline - Composing**

Inline Composing	Off	

## Inline - MapIt

MapIt	None
Flip Angle	4 deg
Measurements	1
Contrasts	1
TE	5.10 ms
TR	12.0 ms
Save Original Images	On

## Sequence - Part 1

Sequence Name	fl_r
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	On
Bandwidth	420 Hz/Px
Asymmetric Echo	Allowed
Segments	1

## Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_T1W

TA: 1:15 min Coil Selection: Auto Voxel Size: 0.6×0.6×3.0 mm³ Acc:: 2 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
TE	5.10 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	12.0 ms
TE	5.10 ms
MTC	Off
Magn. Preparation	None
Flip Angle	17 deg
Fat-Water Contrast	Standard
Dark Blood	Off
Contrasts	1
SWI	Off
Reconstruction	Magn./Phase

## **Contrast - Dynamic**

Dynamic Mode	Standard
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
Base Resolution	256
Phase Resolution	100 %
Slice Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	Integrated
Acceleration Factor PE	2
Reference Lines PE	24
Acceleration Factor 3D	1
Phase Partial Fourier	Off
Slice Partial Fourier	Off
Asymmetric Echo	Allowed
Elliptical Scanning	Off

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

## **Geometry - Common**

Slab Group	1
Slabs	1
Distance Factor	20 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Slices per Slab	40
Phase Oversampling	0 %
Slice Oversampling	10.0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	3.0 mm
TR	12.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

## Geometry - AutoAlign

Slab Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Saturation**

Saturation Mode	Standard
Special Saturation	None

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

#### System - Miscellaneous

Coil Selection	Default
MSMA	S - C - T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

#### **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Standard
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

#### **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	120 mm
Reset	Off

## System - pTx

B1 Shim	TrueForm
Excitation	Slab-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Physio - Signal

1st Signal/Mode	None
TR	12.0 ms
Segments	1
Concatenations	1

## Physio - Cardiac

Tagging	None	
Fat-Water Contrast	Standard	
Magn. Preparation	None	
Dark Blood	Off	
FoV Read	160 mm	
FoV Phase	100.0 %	
Phase Resolution	100 %	
Dynamic Mode	Standard	

## Physio - PACE

Resp. Control	Off
Concatenations	1

#### Inline - Liver

Liver Registration	Off	
Save Original Images	On	

#### **Inline - Subtraction**

Subtract	Off
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#### **Inline - Subtraction**

Measurements	1
StdDev	Off
Save Original Images	On

#### Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
Contrasts	1
TE	5.10 ms
TR	12.0 ms

#### Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

#### **Inline - Soft Tissue**

Wash-in	Off
Wash-out	Off
TTP	Off
PEI	Off
MIP Time	Off
Measurements	1

#### **Inline - Composing**

Inline Composing	Off	

## Inline - MapIt

MapIt	None
Flip Angle	17 deg
Measurements	1
Contrasts	1
TE	5.10 ms
TR	12.0 ms
Save Original Images	On

#### Sequence - Part 1

-	
Sequence Name	fl_r
Dimension	3D
Excitation	Slab-sel.
RF Pulse Type	Fast
Gradient Mode	Fast
Flow Compensation	On
Bandwidth	420 Hz/Px
Asymmetric Echo	Allowed
Segments	1

## Sequence - Part 2

Introduction	On	
RF Spoiling	On	
Acoustic noise reduction	Off	

SAR Assistant	Off
Allowed Delay	0 s

## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_B1map

TA: 25 sec Coil Selection: Auto Voxel Size: 1.3×1.3×6.0 mm³ Acc:: None Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### Routine

Slice Group	1
Slices	20
Distance Factor	100 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	11530.0 ms
TE	2.03 ms
Averages	1
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	11530.0 ms
TE	2.03 ms
Magn. Preparation	None
Flip Angle	8 deg
Fat-Water Contrast	Standard
Reconstruction	Magnitude

## **Contrast - Dynamic**

Dynamic Mode	Standard
1 *	Statidatu
Measurements	1
Multiple Series	Each Measurement

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
Base Resolution	128
Phase Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	None
Phase Partial Fourier	Off
Asymmetric Echo	Allowed

### **Resolution - Filter**

Raw Filter	Off

#### **Resolution - Filter**

Elliptical Filter	Off
Distortion Correction	2D
Normalize	Off
Image Filter	Off

#### **Geometry - Common**

Slice Group	1
Slices	20
Distance Factor	100 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	11530.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

#### **Geometry - AutoAlign**

<u> </u>	
Slice Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

## **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Sum of Squares
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard
B0 Shim	Tune up
B1 Shim	TrueForm
Adjustment Tolerance	Auto
Adjust with Body Coil	Off
Confirm Frequency	Never
Assume Silicone	Off

# System - Adjust Volume

Position	Isocenter
Orientation	Transversal
Rotation	0.00 deg
A >> P	263 mm
R >> L	350 mm
F >> H	350 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Slice-sel.

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

## Inline - Subtraction

Subtract	Off
Measurements	1
StdDev	Off
Save Original Images	On

## Inline - Cardiac

Magn. Preparation	None
Save Original Images	On
TE	2.03 ms
TR	11530.0 ms

## Inline - MIP

MIP Sag	Off
MIP Cor	Off
MIP Tra	Off
MIP Time	Off
Radial MIP	Off
Save Original Images	On
MPR Sag	Off
MPR Cor	Off
MPR Tra	Off

## Inline - Composing

	0"
Inline Composina	Off

## Sequence - Part 1

Sequence Name	tfl
Dimension	2D
Excitation	Slice-sel.
RF Pulse Type	Low SAR
Gradient Mode	Normal
Flow Compensation	None
Bandwidth	490 Hz/Px
Echo Spacing	4.50 ms
Asymmetric Echo	Allowed
Turbo Factor	128

## Sequence - Part 2

Introduction	On
RF Spoiling	On

SAR ASSISTANT OTT
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## \\MRI Research\Knee\NIH\NIH\_R61NS119434\_Chen\_20221103\calf\_ep2d\_diff20\_new

TA: 8:46 min Coil Selection: Auto Voxel Size: 1.3×1.3×6.0 mm³ Acc:: 3 Rel. SNR: 1.00

#### **Properties**

Start measurement without further preparation	On
Wait for User to Start	Off
Start measurements	Single Measurement
Prio Recon	Off
Auto Open Inline Display	Off
Auto Close Inline Display	Off
Load Images to MR View&GO	On
Auto Store Images	On
Load Images to Stamp Segments	Off
Load Images to Graphic Segments	Off
Graphic segment	Default
Inline Movie	Off

#### **Routine**

Slice Group	1
Slices	16
Distance Factor	0 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	4000.0 ms
TE	93.00 ms
Concatenations	1
AutoAlign	
Coil Elements	18K

#### **Contrast - Common**

TR	4000.0 ms
TE	93.00 ms
MTC	Off
Magn. Preparation	None
Fat-Water Contrast	SPAIR
Fat Saturation	Strong
Reconstruction	Magnitude

## **Contrast - Dynamic**

Dynamic Mode	Standard
Multiple Series	Off
Delay in TR	0.00 ms

#### **Resolution - Common**

FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
Base Resolution	128
Phase Resolution	100 %
Interpolation	Off

#### **Resolution - Acceleration**

Acceleration mode	GRAPPA
Reference Scans	EPI/Separate
Acceleration Factor PE	3
Reference Lines PE	78
Phase Partial Fourier	6/8

#### **Resolution - Filter**

Raw Filter	Off
Elliptical Filter	Off
Distortion Correction	Off
Normalize	Off

#### **Geometry - Common**

Slice Group	1
Slices	16
Distance Factor	0 %
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
Phase Oversampling	0 %
FoV Read	160 mm
FoV Phase	100.0 %
Slice Thickness	6.0 mm
TR	4000.0 ms
Multi-Slice Mode	Interleaved
Series	Interleaved
Concatenations	1

### **Geometry - AutoAlign**

Slice Group	1
Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Phase Encoding Dir.	A >> P
AutoAlign	
Initial Position	R34.4 A24.0 F1.3
R	34.4 mm
A	24.0 mm
F	1.3 mm
Initial Orientation	T > C
T > C	1.20
> S	0.00
Initial Rotation	0.00 deg

## **Geometry - Navigator**

## **Geometry - Saturation**

Special Saturation	Mana	
Special Saturation	None	

### **Geometry - Tim Planning Suite**

Set-n-Go Protocol	Off
Table Position	0 mm
Table Position	Н
Inline Composing	Off

### **System - Miscellaneous**

Coil Selection	Default
MSMA	S-C-T
Sagittal	R >> L
Coronal	A >> P
Transversal	F >> H
Coil Combination	Adaptive Combine
Matrix Optimization	Off

## **System - Adjustments**

Adjustment Strategy	Standard	
B0 Shim	Standard	
B1 Shim	TrueForm	

# System - Adjustments

ĺ	Adjustment Tolerance	Auto
	Adjust with Body Coil	Off
	Confirm Frequency	Never
	Assume Silicone	Off

## **System - Adjust Volume**

Position	R34.4 A24.0 F1.3 mm
Orientation	T > C1.2
Rotation	0.00 deg
A >> P	160 mm
R >> L	160 mm
F >> H	96 mm
Reset	Off

# System - pTx

B1 Shim	TrueForm
Excitation	Standard

## System - Tx/Rx

Frequency 1H	123.248547 MHz
? Ref. Amplitude 1H	0.000 V
Reset	Off
Correction Factor	1.00
Image Scaling	1.000

# Physio - Signal

1st Signal/Mode	None
TR	4000.0 ms
Concatenations	1

# Physio - PACE

Resp. Control	Off
Concatenations	1

## Diff

Diffusion Mode	MDDW
Diff. Directions	20
Diffusion Scheme	Bipolar
Diff. Weightings	2
b-value 1	0 s/mm²
b-value 2	800 s/mm <sup>2</sup>
Averages 1	6
Averages 2	6
Dynamic Field Correction	Off
Invert Gray Scale	Off
Diff. Weighted Images	On
Trace Weighted Images	On
Tensor	On
FA Maps	On
ADC Maps	On
Exponential ADC Maps	Off
ADC Noise Threshold	6
Calculated Image	Off

## Sequence - Part 1

Sequence Name	epse
Excitation	Standard
RF Pulse Type	Normal
Gradient Mode	Fast
Bandwidth	1028 Hz/Px
Echo Spacing	1.10 ms
Free Echo Spacing	Off
Optimization	None

EPI Factor	128	
Sequence - Part 2		
Introduction	On	
Phase Correction	Internal	