

Some protocol suggestions for ksepi.e

DV26+ users

Online recon is no longer supported as GE's Orchestra recon does not handle EPI with normal DAB packets. Recon can be done offline using recon_epi.m, or, on the MR scanner's VRE using provided RPM version of ksepi ([http://bit.ly/ksepi RPM](http://bit.ly/ksepi_RPM))

It is also possible to build your own RPM install file using the matlab folder in the KSFoundation repository

Pre-DV26 users

Karolinska has no longer access to pre-DV26 systems. Hence, GE's online recon for ksepi (working on DV24-25 only) and Pfile reading is soon deprecated

14 Feb 2019

mrphysics@neuroradkarolinska.se

ksepi.e - supported scan modes

2D

- Diffusion MRI
- fMRI (no brainwaveRT connection)
- SE-EPI

Multi-shot EPI is used for GRAPPA acceleration. User CV5 controls
Multi-shot vs. undersampling behavior

3D

- T1w 3D-EPI
- SWI 3D-EPI

ARC acceleration support in both phase encoding directions

Diffusion

2D ksepi - Imaging options

Plane: Oblique Mode: 2D

Family:

- ☒ Echo Planar Imaging
- ☐ Fast Spin Echo
- ☐ Gradient Echo
- ☐ MNS
- ☐ Spin Echo
- ☐ Vascular

Pulse:

- ☒ DW EPI
- ☒ Flair EPI
- ☒ Gradient Echo EPI
- ☒ Spin Echo EPI

Imaging Option:

- ☐ None
- ☐ Acoustic Reduction
- ☒ Extended Dynamic Range
- ☐ IR Prepared
- ☐ Sequential
- ☐ ZIP512

Application:

- ☐ 3DASL
- ☐ 3DCINE-SPGR
- ☐ BRAVO
- ☐ CINE IR
- ☐ DISCO
- ☐ MAGIC
- ☐ MR-Touch
- ☐ QuickSTEP
- ☐ T1MAP-FIESTA
- ☐ T2MAP
- ☐ 3DCINE-FIESTA
- ☐ 4DFLOW
- ☐ BREASE
- ☐ COSMIC
- ☐ IDEAL IQ
- ☐ MAVRIC SL
- ☐ MUSE
- ☐ Silenz
- ☐ T1MAP-SPGR
- ☐ TRICKS

PSD Name: ksepi-vre

Accept

Enable the ART tab for acoustic reduction (at the expense of increased geometric distortions)

More bitdepth in data. Leave on

Enables IR for non-FLAIR scans. Could be used as STIR-EPI

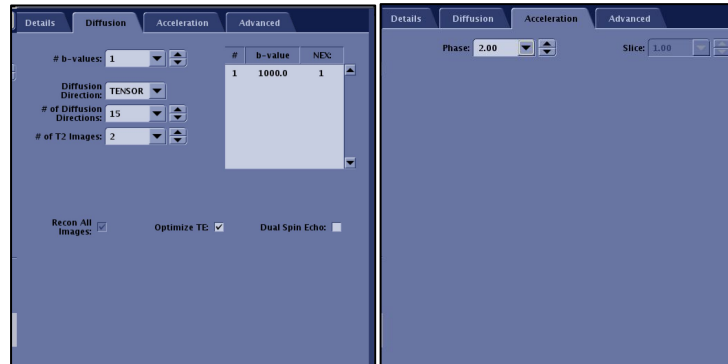
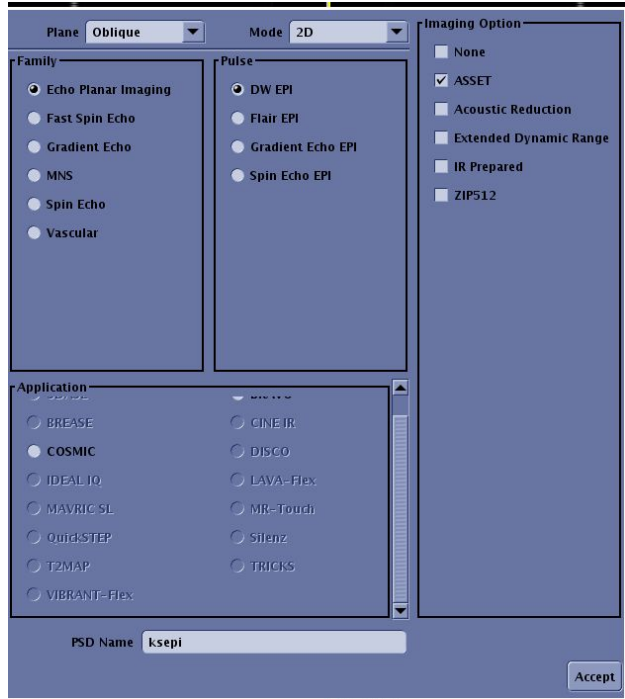
Acquire all time-frames before moving to next slice location

Zerofill to 512x512 matrix. Does increase Gibbs ringing artifacts (not recommended)

- Diffusion-weighted EPI (multi-bvalue DTI supported)
- FLAIR-EPI (contrast similar to a fat-sat T2FLAIR)
- Gradient Echo EPI. For fMRI/perfusion
- Spin Echo EPI

2D ksepi - Diffusion (DV24-DV25.1 with GE online recon)

Images are reconstructed using GE's online recon. However DV24-25 have limited support



2D ksepi - Diffusion (Fast)

Plane: **Oblique** Mode: **2D**

Family:

- ☒ Echo Planar Imaging
 - ☐ Fast Spin Echo
 - ☐ Gradient Echo
 - ☐ MNS
 - ☐ Spin Echo
 - ☐ Vascular
- ☐ DW EPI
 - ☐ Flair EPI
 - ☐ Gradient Echo EPI
 - ☐ Spin Echo EPI

Imaging Option:

- ☐ None
- ☐ Acoustic Reduction
- ☒ Extended Dynamic Range
- ☐ IR Prepared
- ☐ Sequential
- ☐ ZIP512

Application:

- ☐ 3DASL
- ☐ 3DCINE-SPGR
- ☐ BRAVO
- ☐ CINE IR
- ☐ DISCO
- ☐ MAGIC
- ☐ MR-Touch
- ☐ QuickSTEP
- ☐ T1MAP-FIESTA
- ☐ T2MAP
- ☐ 3DCINE-FIESTA
- ☐ 4DFLOW
- ☐ BREASE
- ☐ COSMIC
- ☐ IDEAL IQ
- ☐ MAVRIC SL
- ☐ MUSE
- ☐ Silenz
- ☐ T1MAP-SPGR
- ☐ TRICKS

PSD Name: **ksepi-vre**

Accept

Ax DWI Fast 144 4mm GRx 0:26

Details Diffusion Advanced

Scan Plane: **Oblique** Freq. Dir: **R/L** Freq. FOV: **24.0** Phase FOV: **1.00** Slice Thickness: **4.0** Spacing: **0.0**

TE: **Minimum** # Slices: **38**

Intensity Correction: **PURE** Intensity Filter: **None** Save Original: ☐ 3D Geometry Correction: ☐

Frequency: **144** Phase: **144** Bandwidth: **250.00** Excitation Mode: **Select...** Shim: **Auto** RF Drive Mode: **Preset** Phase Correct: **Off** Table Delta: **0.00**

Num Shots: **2** TE: **Minimum**

Calibration In Prescan: **On**

Start: R/L A/P S/I L2.7 P19.9 I111.5 End: L2.7 A1.8 S34.9

Total # Slices: **38** Max # Slices: **38** # of Acqs: **1** Rel. SNRQ: **100** Pixel Size: **1.7x1.7** Echo Spacing: **0.7**

Chem SAT: **None**

Contrast: ☐

WB-SAR: 0.48 Head-SAR: 1.61 B₁RMS: 1.56pT Mode: First dR/dt: First

Minimum TE: 58.7 Maximum TE: 58.7

Details Diffusion Advanced

b-values: **1** # b-value: **1000.0** NEC: **1.0**

Diffusion Direction: **ALL** # of Diffusion Directions: **3** # of T2 Images: **1** # Synthetic b-values: **0**

Recon All Images: ☐ Super G: ☐ Dual Spin Echo: ☐

Details Diffusion Advanced

User Control Variables

		Min	Max
CV0	PSD version: 0000aaa	0.00	0.0 0.0
CV1	#extralines for MinTE	24.00	8.0 512.0
CV2	Blip polarity: +1/-1	1.00	-1.0 1.0
CV5	0-PI 1:All MuShot 2:1stMuShot 3:b0MuShot	3.00	0.0 3.0
CV6	Diff maps AIB0 Acd1 b0-2 DW4 ADC8 Exp16 FA32 fFA64	0.00	0.0 128.0
CV8	FLEET calibration volume (0:OFF 1:ON)	1.00	0.0 1.0
CV9	Number of phase reference lines per shot	0.00	0.0 96.0
CV41	Intensity Correction Threshold	5.00	0.5 5.0

CV1: Number of k-space lines beyond half k-space for MinTE scans. Lower value gives shorter TE but risk for dark phase "worms" in the image

CV2: Positive or negative phase encoding blips. This controls the direction of geometric distortions along the phase encoding direction (A/P)

CV5 = 3: Multishot only for b0 (from which GRAPPA weights are estimated using recon_epi.m). Diffusion directions undersampled (R = #shots). Don't select 0 (!)

CV6: 0 will return everything (in different series). For custom choice of maps to be returned, add the numbers up (bitmask)

CV8: FLEET calibration. An extra few-second volume is added for calibration, more robust GRAPPA weights in the presence of motion

2D ksepi - Diffusion (High-res)

Plane: Oblique Mode: 2D

Family

- ☒ Echo Planar Imaging
 - ☐ Fast Spin Echo
 - ☐ Gradient Echo
 - ☐ MNS
 - ☐ Spin Echo
 - ☐ Vascular
- ☒ DW EPI
 - ☐ Flair EPI
 - ☐ Gradient Echo EPI
 - ☐ Spin Echo EPI

Pulse

- ☐ None
- ☐ Acoustic Reduction
- ☒ Extended Dynamic Range
- ☐ IR Prepared
- ☐ Sequential
- ☐ ZIP512

Application

- ☐ 3DASL
- ☐ 3DCINE-SPGR
- ☐ BRAVO
- ☐ CINE IR
- ☐ DISCO
- ☐ MAGIC
- ☐ MR-Touch
- ☐ QuickSTEP
- ☐ T1MAP-FIESTA
- ☐ T2MAP
- ☐ 3DCINE-FIESTA
- ☐ 4DFLOW
- ☐ BREASE
- ☐ COSMIC
- ☐ IDEAL IQ
- ☐ MAVRIC SL
- ☐ MUSE
- ☐ Silenz
- ☐ T1MAP-SPGR
- ☐ TRICKS

PSD Name: ksepi-vre

Accept

Ax DTI 35dir 224 4... GRx 2:42

Details Diffusion Advanced

Scan Plane: Oblique Freq. Dir: **R/L** Freq. FOV: 24.0 TR: Minimum # Slices: 38

Phase FOV: 1.00 Slice Thickness: 4.0 Spacing: 0.0

R/L A/P S/I

Start: L2.7 P28.0 I145.6

End: L2.7 P37.1 S2.2

Chem SAT: None

Total # Slices: 38 Max # Slices: 38 # of Acqs: 1 Rel. SNRQ: 100 Pixel Size: 1.1x1.1 Echo Spacing: 1.0

Contrast:

WB-SAR: 0.43 Head-SAR: 1.43 B₁-RMS: 1.47μT Mode: First dB/dt: First

Minimum TE: 58.2 Maximum TE: 58.2

Details Diffusion Advanced

b-values: 1 # b-value: 1000.0 NEX: 1.0

Diffusion Direction: TENSOR

of Diffusion Directions: 35

of T2 Images: 1

Synthetic b-values: 0

Recon All Images: ☒ Super G: ☐ Dual Spin Echo: ☐

Details Diffusion Advanced

User Control Variables

		Min	Max
CV0	PSD version: 0000aax	0.00	0.0 0.0
CV1	#extralines for MinTE	24.00	8.0 512.0
CV2	Blip polarity: +1/-1	1.00	-1.0 1.0
CV5	0:PI 1:All Multishot 2:1stMultishot 3:b0Multishot	3.00	0.0 3.0
CV6	Diff maps All:0 Acq:1 b0:2 DW:b4 ADC:8 Exp:16 FA:32 cFA:64	0.00	0.0 128.0
CV8	FLEET calibration volume (0:OFF 1:ON)	1.00	0.0 1.0
CV9	Number of phase reference lines per shot	0.00	0.0 96.0
CV41	Intensity Correction Threshold	5.00	0.5 5.0

CV1: Number of k-space lines beyond half k-space for MinTE scans. Lower value gives shorter TE but risk for dark phase "worms" in the image

CV2: Positive or negative phase encoding blips. This controls the direction of geometric distortions along the phase encoding direction (A/P)

CV5 = 3: Multishot only for b0 (from which GRAPPA weights are estimated using recon_epi.m). Diffusion directions undersampled (R = #shots). Don't select 0 (!)

CV6: 0 will return everything (in different series). For custom choice of maps to be returned, add the numbers up (bitmask)

CV8: FLEET calibration. An extra few-second volume is added for calibration, more robust GRAPPA weights in the presence of motion

2D ksepi - Diffusion (isotropic)

Plane: **Oblique** Mode: **2D**

Imaging Option

- ☐ None
- ☐ Acoustic Reduction
- ☒ Extended Dynamic Range
- ☐ IR Prepared
- ☐ Sequential
- ☐ ZIP512

Family

- ☒ Echo Planar Imaging
 - ☐ Fast Spin Echo
 - ☐ Gradient Echo
 - ☐ MNS
 - ☐ Spin Echo
 - ☐ Vascular
- ☒ Pulse
 - ☒ DW EPI
 - ☐ Flair EPI
 - ☐ Gradient Echo EPI
 - ☐ Spin Echo EPI

Application

- ☐ 3DASL
- ☐ 3DCINE-SPGR
- ☐ BRAVO
- ☐ CINE IR
- ☐ DISCO
- ☐ MAGIC
- ☐ MR-Touch
- ☐ QuickSTEP
- ☐ T1MAP-FIESTA
- ☐ T2MAP
- ☐ 3DCINE-FIESTA
- ☐ 4DFLOW
- ☐ BREASE
- ☐ COSMIC
- ☐ IDEAL IQ
- ☐ MAVRIC SL
- ☐ MUSE
- ☐ Silenz
- ☐ T1MAP-SPGR
- ☐ TRICKS

PSD Name: **ksepi-vre**

Accept

Ax DTI 55dir 2x2x2 GRx 7:00

Details Diffusion Advanced

Scan Plane: **Oblique** Freq. Dir: **R/L** (otherwise P/S and ugly images)

Freq. FOV: 24.0 TR: Minimum # Slices: 76

Phase FOV: 1.00 Slice Thickness: 2.0 Spacing: 0.0

R/L A/P S/I

Start L2.7 P27.9 H146.5

End L2.7 P37.2 S3.2

Chem SAT: Fat

Total # Slices: 76 Max # Slices: 76 # of Acqs: 1 Rel. SNRQ: 100 Pixel Size: 2.0x2.0 Echo Spacing: 0.6

of TE/epi Scans: 2 Num Shots: 2 TE: minimum Intensity Correction: PURE Calibration In Prescan: On Intensity Filter: None Save Original: 3D Geometry Correction: 0

Excitation Mode: Select... Shim: Auto RF Drive Mode: Preset Phase Correct: Off Table Delta: 0.00

WB-SAR: 0.43 Head-SAR: 1.44 B₁RMS: 1.57pT Mode: First dB/dt: First

Minimum TE: 56.1 Maximum TE: 56.1

Details Diffusion Advanced

b-values: 1 # b-value: 1000.0 NEX: 1.0

Diffusion Direction: TENSOR

of Diffusion Directions: 55

of T2 Images: 2

Synthetic b-values: 0

Recon All Images: ☒ Super G: ☐ Dual Spin Echo: ☐

Details Diffusion Advanced

User Control Variables

		Min	Max
CV0	PSD version: 0000aaa: 0.00	0.0	0.0
CV1	#extralines for MinTE: 24.00	8.0	512.0
CV2	Blip polarity: +1/-1: 1.00	-1.0	1.0
CV5	0:P1 1:All MultShot 2:1stMultShot 3:0MultShot: 3.00	0.0	3.0
CV6	Diff maps Alt0 Acq:1 b0:2 DW:4 ADC:8 Exp:16 FA:32 cFA:64: 0.00	0.0	128.0
CV8	FLEET calibration volume (0:OFF 1:ON): 1.00	0.0	1.0
CV9	Number of phase reference lines per shot: 0.00	0.0	96.0
CV41	Intensity Correction Threshold: 5.00	0.5	5.0

CV1: Number of k-space lines beyond half k-space for MinTE scans. Lower value gives shorter TE but risk for dark phase "worms" in the image

CV2: Positive or negative phase encoding blips. This controls the direction of geometric distortions along the phase encoding direction (A/P)

CV5 = 3: Multishot only for b0 (from which GRAPPA weights are estimated using recon_epi.m). Diffusion directions undersampled (R = #shots). Don't select 0 (!)

CV6: 0 will return everything (in different series). For custom choice of maps to be returned, add the numbers up (bitmask)

CV8: FLEET calibration. An extra few-second volume is added for calibration, more robust GRAPPA weights in the presence of motion

2D ksepi - Diffusion (isotropic 3-shell HARDI)

Plane: **Oblique** Mode: **2D**

Imaging Option:

- ☐ None
- ☐ Acoustic Reduction
- ☐ Extended Dynamic Range
- ☐ IR Prepared
- ☐ ZIP512

Family:

- ☒ Echo Planar Imaging
- ☐ Fast Spin Echo
- ☐ Gradient Echo
- ☐ MNS
- ☐ Spin Echo
- ☐ Vascular

Pulse:

- ☒ DW EPI
- ☐ Flair EPI
- ☐ Gradient Echo EPI
- ☐ Spin Echo EPI

Application:

- ☐ 3DASL
- ☐ 3DCINE-SPGR
- ☐ BRAVO
- ☐ CINE IR
- ☐ DISCO
- ☐ MAGIC
- ☐ MR-Touch
- ☐ QuickSTEP
- ☐ T1MAP-FIESTA
- ☐ T2MAP
- ☐ 3DCINE-FIESTA
- ☐ 4DFLOW
- ☐ BREASE
- ☐ COSMIC
- ☐ IDEAL IQ
- ☐ MAVRIC SL
- ☐ MUSE
- ☐ Silenz
- ☐ T1MAP-SPGR
- ☐ TRICKS

PSD Name: **ksepi**

Accept

ksepi Diff multishell GRx 27:09

Details Diffusion Advanced

Scan Plane: **Oblique** Freq. Dir: **R/L** # of TE(s) per Scan: **3** Frequency: **120**

Freq. FOV: **24.0** TR: **Minimum** Num Shots: **3** Phase: **120**

Phase FOV: **1.00** # Slices: **80** TE: **Minimum** Bandwidth: **250.00**

Slice Thickness: **2.0** Intensity Correction: **NONE** Excitation Mode: **Select...**

Spacing: **0.0** Intensity Filter: **None** Shim: **Auto**

R/L A/P S/I Total # Slices: **80** Max # Slices: **80** Save Original: ☐ RF Drive Mode: **Preset**

Start: **0.0** **A18.2** **I78.8** # of Acqs: **1** 3D Geometry Correction: ☐ Phase Correct: **Off**

End: **0.0** **P4.2** **S77.6** Rel. SNR: **94** Table Delta: **0.00**

Chem SAT: **Fat** Thin slices requires separate Fat Sat pulse

Contrast: ☐

WB-SAR: 0.37 Head-SAR: 1.24 B₁-RMS: 1.46μT Mode: First dB/dt: First Minimum TE: 68.7 Maximum TE: 68.7

Details Diffusion Advanced

b-values: **3**

Diffusion Direction: **TENSOR**

of Diffusion Directions: **60**

of T2 Images: **5**

Synthetic b-values: **0**

#	b-value	NEC
1	1000.0	1
2	2000.0	1
3	3000.0	1

Diff. Dir is per b-value
T2 images is total for scan

Recon All Images: ☒ Optimize TE: ☒ Dual Spin Echo: ☐

Single/Multi-echo fMRI / T2*-w

2D ksepi - T2* EPI (fMRI - 300 vols)

It is possible to play up to 16 EPI trains in ksepi.e. However, the UI blanks the #TEs per scan after NumShots have been selected, but multi-echo selections can still be made

Plane: ObliqueMode: 2DImaging Option

Family

Echo Planar Imaging

Fast Spin Echo

Gradient Echo

MNS

Spin Echo

Vascular

DW EPI

Flair EPI

Gradient Echo EPI

Spin Echo EPI

IR Prepared

Multi-Phase

ZIP>1.2

Application

3DASL

3DCINE-SPGR

BRAVO

CINE IR

DISCO

MAGIC

MR-Touch

OmniSTEP

T1MAP-FIESTA

T2MAP

3DCINE-FIESTA

4DFLOW

BREASE

COSMIC

IDEAL IQ

MAVRIC SL

MUSE

Silenz

T1MAP-SPGR

TRICKS

PSD Nameksepi

Accept

ksepi fMRI

GRx

Cx

12:49

DetailsMulti-PhaseAdvanced

Scan Plane: ObliqueFreq. Dir: R/LFreq. FOV: 24.0Phase FOV: 1.00Slice Thickness: 3.0Spacing: 0.0

TR: Minimum# Slices: 50

R/L A/P S/IStart 0.0 A14.2 I71.7End 0.0 A19.8 S75.2

Chem SAT: None

Contrast:

of TE(s) per Scan: 2Num Shots: 2TE: Min FullFlip Angle: 90Intensity Correction: NONEIntensity Filter: NoneSave Original: 3D Geometry Correction:

Frequency: 96Phase: 96Bandwidth: 250.00Excitation Mode: Select...Shim: AutoRF Drive Mode: PresetPhase Correct: OFFTable Delta: 0.00

Total # Slices: 50Max # Slices: 50# of Acqs: 1Rel. SNR@: 100

WB-SAR: 0.24Head-SAR: 0.79B₁-RMS: 0.89µTMode: FirstdB/dt: First

Minimum TE: 24.3Maximum TE: 24.3

DetailsMulti-PhaseAdvanced

Total Phases: 300Variable Delays

Phase Acquisition Order

Sequential

Interleaved

Delay After Acq: (sec)

Phase Start Delay (Sec) Auto Voice

Total Time: 12:49Series to Subtract

Auto Subtract

Accept Negative Pixels

Series Per Phase

First Ph Same Series

Previous Series

Series Number

DetailsMulti-PhaseAdvanced

User Control Variables

CV0

PSD version: 0000aaac

0.00

0.0

0.0

CV1

#extralines for MinTE:

24.00

16.0

512.0

CV2

Blip polarity: +1/-1:

1.00

-1.0

1.0

CV5

0:PI 1:All MulShot 2:1stMulShot

2.00

0.0

3.0

CV5 = 2: 1st volume acquired in here 2 shots (fully sampled k-space), while remaining volumes are undersampled as only the 1st shot is played out

SWI 3D-EPI

3D ksepi - SWI (3T)

Plane: Oblique Mode: 3D

Family:

- Fast Spin Echo
- Gradient Echo
- Vascular

Pulse:

- Fast GRE
- Fast SPGR
- Fiesta
- Fiesta-C
- GRE
- LAVA
- MERGE
- SPGR
- SWAN
- VIBRANT

Imaging Option:

- None
- ARC
- Acoustic Reduction
- Extended Dynamic Range
- Flow Compensation
- Multi-Phase
- Sequential
- ZIP512

Application:

- 3DASL
- 3DCINE-SPGR
- BRAVO
- CINE IR
- DISCO
- MAGIC
- MR-Touch
- Quid-STEP
- T1MAP-FIESTA
- T2MAP
- 3DCINE-FIESTA
- 3DFLOW
- BRESSE
- COSMIC
- IDEAL IQ
- MAVRIC SL
- MUSE
- Silenz
- T1MAP-SPGR
- TRICKS

PSD Name: ksepi-vre

Accept

Ax SWI 3DEPI InfSat GRX 0:45

Details Acceleration Advanced

Scan Plane: Oblique Freq. Dir: R/L

Freq. FOV: 24.0 TR: 53.5

Phase FOV: 1.00

Slice Thickness: 2.0

of Scan Lcs: 80

Max # Slices: 2048

of Acqs: 1

Rel. SNR: 103

Pixel Size: 0.8x0.8

Echo Spacing: 1.6

Chem SAT: None

SAT: 1

Contrast:

WB-SAR: 0.43 Head-SAR: 1.42 B₁ RMS: 0.70μT Mode: First dB/dt: First

of TE(s) per Scan: 16

TE: Min Full

Flip Angle: 18

Intensity Correction: PURE

Calibration In Prescan: On

Intensity Filter: None

Save Original: ☐

3D Geometry Correction: ☒

Frequency: 320

Phase: 320

Bandwidth: 125.00

Excitation Mode: Select...

Shim: Auto

RF Drive Mode: Optim...

Phase Correct: Off

Table Delta: 0.00

Minimum TE: 21.3

Maximum TE: 21.3

Freq. Dir: R/L (otherwise PNS and ugly images)

Use about 100 mm inferior sat to avoid flow artifacts in the center of the brain

Use Bandwidth of 125 (or lower) to not override gradients and for increased SNR

1.5T adjustments

- Bandwidth 83.33
- Num Shots 12
- Flip Angle 20

Minimum TE (bottom) should be about 35 ms

Details Acceleration Advanced

Phase: 2.00 Slice: 1.00

Details Acceleration Advanced

User Control Variables

		Min	Max
CV0	PSD version: 0000aaa:	0.00	0.0 0.0
CV1	#extralines for MinTE:	24.00	8.0 512.0
CV2	Blip polarity: +1/-1:	1.00	-1.0 1.0
CV7	SWI recon 0:Off 1:Acq 2:SWI 4:SWIphase:	7.00	0.0 7.0
CV12	Choose 3D RF SPS3D_150mm_stbw10_etbw4_lin_lin:	1.00	0.0 1.0
CV15	Number of acs lines in kz:	16.00	0.0 512.0

CV7: Bitmask. 2 will return just the SWI processed image, 1+2+4=7 will return acquired image, SWI processed image and filtered phase image

CV12: 1 for SPSP RF pulse optimized for 3D

CV15: 8-16 are reasonably good values here

3D ksepi - T1w (isotropic)

Plane: Oblique Mode: 3D

Family:

- Fast Spin Echo
- Gradient Echo**
- Vascular

Pulse:

- Fast GRE
- Fast SPGR**
- Fiesta
- Fiesta-C
- GRE
- LAVA
- MERGE
- SPGR
- SWAN
- VIBRANT

Imaging Option:

- ☐ None
- ☒ ARC
- ☐ Acoustic Reduction
- ☒ Extended Dynamic Range
- ☐ Flow Compensation
- ☐ Multi-Phase
- ☐ Sequential
- ☐ ZIP512

Application:

- 3DASL**
- 3DCINE-SPGR
- BRAVO
- CINE IR
- DISCO
- MAGIC
- MR-Touch
- QuickSTEP
- T1MAP-FIESTA
- T2MAP
- 3DCINE-FIESTA
- 4DFLOW
- BREASE
- COSMIC
- IDEAL IQ
- MAVRIC SL
- MUSE
- Silenz
- T1MAP-SPGR
- TRICKS

PSD Name: ksepi-vre

Accept

Sag T1w R2x1 12sh GRx Cx 0:27

Scan Plane: Sagittal Freq. Dir: S/I

Freq. FOV: 24.0 Phase FOV: 1.00 Slice Thickness: 1.2 # of Scan Locs: 160

R/L P/A I/S

Start: L94.3 P13.4 I67.3 End: R96.5 P13.4 I67.3

Chem SAT: None

Max # Slices: 2048 # of Acqs: 1 Rel. SNRQ: 100 Pixel Size: 1.2x1.1 Echo Spacing: 1.0

Contrast:

WB-SAR: 0.12 Head-SAR: 0.41 B₁ RMS: 0.84μT Mode: First dB/dt: First

Acceleration:

of TE0s per Scan: 12 Num Shots: 12 TE: Minimum Flip Angle: 30 Intensity Correction: PURE Calibration in Prescan: On Intensity Filter: None Save Original: ☐ 3D Geometry Correction: ☒

Frequency: 192 Phase: 224 Bandwidth: 125.00 Excitation Mode: Select... Shim: Auto RF Drive Mode: Optim... Phase Correct: Off Table Delta: 0.00

Minimum TE: 7.5 Maximum TE: 7.5

Use Bandwidth of 125 (or lower) to not overdrive gradients and for increased SNR

Details Acceleration Advanced

Phase: 2.00 Slice: 1.00

Details Acceleration Advanced

User Control Variables

		Min	Max
CV0	PSD version: 0000aax	0.00	0.0 0.0
CV1	#extralines for MinTE	24.00	8.0 512.0
CV2	Blip polarity: +1/-1	1.00	-1.0 1.0
CV7	SWI recon 0:Off 1:Acq 2:SWI 4:SWIphase	0.00	0.0 7.0
CV12	SPSP3D_150mm_sbw10_etbw4_lin_lin Choose 3D RF	1.00	0.0 1.0
CV15	Number of acs lines in kz	8.00	0.0 512.0
CV41	Intensity Correction Threshold	5.00	0.5 5.0

CV7: Set to 0 since not SWI

CV12: 1 for SPSP RF pulse optimized for 3D

CV15: 8-16 are reasonably good values here

Matlab offline recon: recon_epi.m

- How to run (autodetects 2D vs 3D):
 - `>> recon_epi`
- Supports:
 - Mac, Linux, Windows
 - Pfiles (multivolume Pfiles) & ScanArchives
 - Diffusion & non-Diffusion, 3D-EPI
 - Multi-echo & multi-shot
 - ksep.e (but also prod GE epi.e & epi2.e)
 - ASSET (deprecated)
 - Eddy current & motion correction (2D)

