**Table of contents**

\\USER

FMRIB User

2024\_901 Visual Impairment

Protocol v6

[localiser\_3plane\_64ch](#_bookmark0)

[t1\_mpr\_ax\_1mm\_iso\_withNose\_64ch\_v2](#_bookmark1) [diff\_PA\_MPopt\_MB3\_3b0\_lowflip](#_bookmark2) [diff\_AP\_MPopt\_MB3\_50b1000\_50b2000\_8b0\_lowflip](#_bookmark3)

[bold\_mbep2d\_2mm\_MB4\_v2\_clipping\_check](#_bookmark8) [bold\_mbep2d\_2mm\_MB4\_v2\_PRF](#_bookmark9)

[\_mapping\_1](#_bookmark9) [bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_mapping](#_bookmark10)

[\_2](#_bookmark10) [bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_mapping\_3](#_bookmark11) [bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_mapping\_4](#_bookmark12) [fieldmap\_gre\_2mm\_mb](#_bookmark13) [bold\_mbep2d\_2mm\_MB6\_v2\_RS](#_bookmark14)

TA: 0:14 PM: REF Voxel size: 0.5×0.5×7.0 mmPAT: Off Rel. SNR: 1.00 : fl

**\\USER\FMRIB User\2024\_901 Visual Impairment\Protocol v6\localiser\_3plane\_64ch**

**Properties**

Off On Off On On On Off Off

On

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

Off

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A30.6 F4.8 mm |
| Orientation | Sagittal |
| Phase enc. dir. | A >> P |
| Slice group | 2 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A20.6 F4.8 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| Slice group | 3 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A20.6 F4.8 mm |
| Orientation | Coronal |
| Phase enc. dir. | R >> L |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 250 mm |
| FoV phase | 100.0 % |
| Slice thickness | 7.0 mm |
| TR | 8.6 ms |
| TE | 4.00 ms |
| Averages | 2 |
| Concatenations | 3 |
| Filter | Normalize, Elliptical filter |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE TD MTC

Magn. preparation Flip angle

Fat suppr. Water suppr.

SWI

8.6 ms

4.00 ms

0 ms Off None 20 deg None None Off

**Contrast - Dynamic**

**Contrast - Dynamic**

Multiple series Each measurement

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

250 mm

100.0 %

7.0 mm

256

91 %

Off On

**Resolution - iPAT**

PAT mode None

**Resolution - Filter Image**

Image Filter Distortion Corr. Prescan Normalize Normalize

B1 filter

Off Off Off On

Off

**Resolution - Filter Rawdata**

Raw filter

Elliptical filter

Off

On

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A30.6 F4.8 mm |
| Orientation | Sagittal |
| Phase enc. dir. | A >> P |
| Slice group | 2 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A20.6 F4.8 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| Slice group | 3 |
| Slices | 1 |
| Dist. factor | 20 % |
| Position | L0.0 A20.6 F4.8 mm |
| Orientation | Coronal |
| Phase enc. dir. | R >> L |
| FoV read | 250 mm |
| FoV phase | 100.0 % |
| Slice thickness | 7.0 mm |
| TR | 8.6 ms |
| Multi-slice mode | Sequential |
| Series | Interleaved |
| Concatenations | 3 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A30.6 F4.8 mm  Sagittal A >> P |
| Slice group | 2 |
| Position  Orientation | L0.0 A20.6 F4.8 mm  Transversal |

Averages Averaging mode Reconstruction

Measurements

2

Short term Magnitude 1

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Phase enc. dir. | A >> P |
| Slice group | 3 |
| Position Orientation  Phase enc. dir. | L0.0 A20.6 F4.8 mm  Coronal R >> L |
| AutoAlign | --- |
| Initial Position | Isocenter |
| L | 0.0 mm |
| P | 0.0 mm |
| H | 0.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Saturation mode Fat suppr.

Water suppr.

Special sat.

Standard None None

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Save uncombined Matrix Optimization AutoAlign

Coil Select Mode

REF H

0 mm

S - C - T R >> L A >> P F >> H

Adaptive Combine Off

Off

---

On - AutoCoilSelect

**System - Adjustments**

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment Assume Dominant Fat Assume Silicone

Adjustment Tolerance

Tune up TrueForm Off

Off Off Off

Auto

**System - Adjust Volume**

Position Orientation Rotation

A >> P R >> L F >> H

Reset

Isocenter Transversal

0.00 deg

263 mm

350 mm

350 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Slice-sel.

**System - Tx/Rx**

**Physio - Signal1**

1st Signal/Mode TR

Concatenations

Segments

None

8.6 ms

3

1

**Physio - Cardiac**

Magn. preparation Fat suppr.

Dark blood FoV read FoV phase

Phase resolution

None None Off

250 mm

100.0 %

91 %

**Physio - PACE**

Resp. control

Concatenations

Off

3

**Inline - Common**

Subtract Measurements StdDev

Liver registration

Save original images

Off 1

Off Off

On

**Inline - MIP**

MIP-Sag MIP-Cor MIP-Tra

MIP-Time

Save original images

Off Off Off Off

On

**Inline - Soft Tissue**

Wash - In Wash - Out TTP

PEI

MIP - time Measurements

Off Off Off Off Off

1

**Inline - Composing**

Distortion Corr. Off

**Sequence - Part 1**

123.255752 MHz

1

High 1.000

Off

0.000 V

Introduction Dimension

Phase stabilisation Asymmetric echo Contrasts

Flow comp. Multi-slice mode

Bandwidth

On 2D

Off Allowed 1

No Sequential

320 Hz/Px

**Sequence - Part 2**

Segments

Acoustic noise reduction RF pulse type

Gradient mode Excitation

RF spoiling

1

None Normal Normal Slice-sel. On

**Sequence - Assistant**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

Mode

Allowed delay

Off

0 s

TA: 7:21 PM: REF Voxel size: 1.0×1.0×1.0 mmPAT: Off Rel. SNR: 1.00 : tfl

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\t1\_mpr\_ax\_1mm\_iso\_withNose\_64c h\_v2**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slab group | 1 |
| Slabs | 1 |
| Dist. factor | 50 % |
| Position | L0.0 A15.0 H15.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | R >> L |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| Slice oversampling | 0.0 % |
| Slices per slab | 192 |
| FoV read | 256 mm |
| FoV phase | 90.6 % |
| Slice thickness | 1.00 mm |
| TR | 1900.0 ms |
| TE | 3.96 ms |
| Averages | 1 |
| Concatenations | 1 |
| Filter | Raw filter, Prescan |
|  | Normalize |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE

Magn. preparation TI

Flip angle

Fat suppr. Water suppr.

1900.0 ms

3.96 ms Non-sel. IR 912 ms

8 deg

Water excit. normal None

**Contrast - Dynamic**

Averages Averaging mode Reconstruction Measurements

Multiple series

1

Long term Magnitude 1

Each measurement

**Resolution - Common**

**Resolution - Common**

Slice partial Fourier

Interpolation

Off

Off

**Resolution - iPAT**

PAT mode None

**Resolution - Filter Image**

Image Filter Distortion Corr. Prescan Normalize Unfiltered images Normalize

B1 filter

Off Off On On Off

Off

**Resolution - Filter Rawdata**

Raw filter

Elliptical filter

On

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slab group | 1 |
| Slabs | 1 |
| Dist. factor | 50 % |
| Position | L0.0 A15.0 H15.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | R >> L |
| Slice oversampling | 0.0 % |
| Slices per slab | 192 |
| FoV read | 256 mm |
| FoV phase | 90.6 % |
| Slice thickness | 1.00 mm |
| TR | 1900.0 ms |
| Multi-slice mode | Single shot |
| Series | Ascending |
| Concatenations | 1 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slab group | 1 |
| Position Orientation Phase enc. dir. | L0.0 A15.0 H15.0 mm  Transversal R >> L |
| AutoAlign | --- |
| Initial Position | Isocenter |
| L | 0.0 mm |
| P | 0.0 mm |
| H | 0.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Navigator System - Miscellaneous**

FoV read FoV phase

Slice thickness Base resolution Phase resolution Slice resolution

Phase partial Fourier

256 mm

90.6 %

1.00 mm

256

100 %

100 %

Off

Positioning mode Table position Table position MSMA

Sagittal Coronal

Transversal

REF H

0 mm

S - C - T R >> L A >> P F >> H

**System - Miscellaneous**

|  |
| --- |
| Coil Combine Mode Adaptive Combine  Save uncombined Off  Matrix Optimization Off  AutoAlign ---  Coil Select Mode Off - All |

**System - Adjustments**

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment Assume Dominant Fat Assume Silicone

Adjustment Tolerance

Standard TrueForm Off

Off Off Off

Auto

**System - Adjust Volume**

Position Orientation Rotation

R >> L A >> P F >> H

Reset

L0.0 A15.0 H15.0 mm

Transversal

90.00 deg

232 mm

256 mm

192 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Slab-sel.

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

Low 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Concatenations

None 1900.0 ms

1

**Physio - Cardiac**

Magn. preparation TI

Fat suppr. Dark blood FoV read FoV phase

Phase resolution

Non-sel. IR 912 ms

Water excit. normal Off

256 mm

90.6 %

100 %

**Physio - PACE**

Resp. control

Concatenations

Off

1

**Inline - Common**

Subtract Measurements StdDev

Save original images

Off 1

Off

On

**Inline - MIP**

**Inline - MIP**

MIP-Tra

MIP-Time

Save original images

Off Off

On

**Inline - Composing**

Distortion Corr. Off

**Sequence - Part 1**

Introduction Dimension Elliptical scanning Reordering Asymmetric echo Flow comp.

Multi-slice mode Echo spacing

Bandwidth

Off 3D

Off Linear Allowed No

Single shot

9.2 ms

200 Hz/Px

**Sequence - Part 2**

RF pulse type Gradient mode Excitation

RF spoiling

Incr. Gradient spoiling Turbo factor

Normal Normal Slab-sel. On

Off

192

**Sequence - Assistant**

Mode Off

MIP-Sag

MIP-Cor

Off

Off

TA: 0:36 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epse

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\diff\_PA\_MPopt\_MB3\_3b0\_lowflip**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

Off

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 P0.5 H24.2 mm |
| Orientation | T > C-14.9 |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 210 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 3600 ms |
| TE | 92.00 ms |
| Multi-band accel. factor | 3 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle Refocus flip angle Fat suppr.

Grad. rev. fat suppr.

3600 ms

92.00 ms

Off None 78 deg

160 deg Fat sat.

Disabled

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 1

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

210 mm

100.0 %

2.00 mm

104

100 %

6/8

Off

**Resolution - iPAT**

PAT mode None

**Resolution - Filter Image**

Distortion Corr. Prescan Normalize

Dynamic Field Corr.

Off Off

Off

**Resolution - Filter Rawdata**

Raw filter

Elliptical filter

Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 P0.5 H24.2 mm |
| Orientation | T > C-14.9 |
| Phase enc. dir. | A >> P |
| FoV read | 210 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 3600 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 3 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 P0.5 H24.2 mm T > C-14.9  A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 P0.5 H24.2 |
| R | 0.0 mm |
| P | 0.5 mm |
| H | 24.2 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | T > C |
| T > C | -14.9 |
| > S | 0.0 |

**Geometry - Saturation**

Fat suppr.

Grad. rev. fat suppr. Special sat.

Fat sat. Disabled

None

**Geometry - Navigator System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Off

---

Off - All

**System - Adjustments**

B0 Shim mode Standard

**System - Adjustments**

|  |
| --- |
| B1 Shim mode TrueForm  Adjust with body coil Off  Confirm freq. adjustment Off  Assume Dominant Fat Off  Assume Silicone Off  Adjustment Tolerance Maximum |

**System - Adjust Volume**

Position Orientation Rotation

A >> P R >> L F >> H

Reset

L0.0 P0.5 H24.2 mm T > C-14.9

0.00 deg

210 mm

210 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 3600 ms

3

**Physio - PACE**

Resp. control

Multi-band accel. factor

Off

3

**Diff - Neuro**

Diffusion mode Diff. directions Diffusion Scheme Diff. weightings

b-value b-value

Diff. weighted images Trace weighted images ADC maps

FA maps Mosaic Tensor

Noise level

Free 6

Monopolar 1

2000 s/mm²

1

On Off Off Off Off Off 40

**Diff - Body**

**Diff - Body**

FA maps

Invert Gray Scale Calculated Image b-Value >=

Noise level

Off Off Off

0 s/mm²

40

**Diff - Composing**

Distortion Corr. Off

**Sequence - Part 1**

Introduction Multi-slice mode

Free echo spacing Echo spacing

Bandwidth

Off Interleaved Off

0.67 ms

1780 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

104

Fast Standard Off

**Sequence - Special**

Excite pulse duration Refocus pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble Time-shifted MB RF SENSE1 coil combine Invert RO/PE polarity PF omits higher k-space Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

5120 us

10240 us

On Off Off Off Off On On Off Off Off Online 1.00

Off

Diffusion mode Diff. directions Diffusion Scheme Diff. weightings

b-value b-value

Diff. weighted images Trace weighted images ADC maps

Exponential ADC Maps

Free 6

Monopolar 1

2000 s/mm²

1

On Off Off Off

TA: 6:32 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epse

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\diff\_AP\_MPopt\_MB3\_50b1000\_50b2 000\_8b0\_lowflip**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

Off

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 P0.5 H24.2 mm |
| Orientation | T > C-14.9 |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 210 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 3600 ms |
| TE | 92.00 ms |
| Multi-band accel. factor | 3 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle Refocus flip angle Fat suppr.

Grad. rev. fat suppr.

3600 ms

92.00 ms

Off None 78 deg

160 deg Fat sat.

Disabled

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 1

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

210 mm

100.0 %

2.00 mm

104

100 %

6/8

Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr. Prescan Normalize

Dynamic Field Corr.

Off Off

Off

**Resolution - Filter Rawdata**

Raw filter

Elliptical filter

Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 P0.5 H24.2 mm |
| Orientation | T > C-14.9 |
| Phase enc. dir. | A >> P |
| FoV read | 210 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 3600 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 3 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 P0.5 H24.2 mm T > C-14.9  A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 P0.5 H24.2 |
| R | 0.0 mm |
| P | 0.5 mm |
| H | 24.2 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | T > C |
| T > C | -14.9 |
| > S | 0.0 |

**Geometry - Saturation**

Fat suppr.

Grad. rev. fat suppr. Special sat.

Fat sat.

Disabled None

**Geometry - Navigator System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Off

---

Off - All

PAT mode None

**System - Adjustments**

|  |
| --- |
| B0 Shim mode Standard  B1 Shim mode TrueForm  Adjust with body coil Off  Confirm freq. adjustment Off  Assume Dominant Fat Off  Assume Silicone Off  Adjustment Tolerance Maximum |

**System - Adjust Volume**

Position Orientation Rotation

A >> P R >> L F >> H

Reset

L0.0 P0.5 H24.2 mm T > C-14.9

0.00 deg

210 mm

210 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 3600 ms

3

**Physio - PACE**

Resp. control

Multi-band accel. factor

Off

3

**Diff - Neuro**

Diffusion mode Diff. directions Diffusion Scheme Diff. weightings

b-value 1

b-value 2

b-value 1

b-value 2

Diff. weighted images Trace weighted images ADC maps

FA maps Mosaic Tensor

Noise level

Free 104

Monopolar 2

0 s/mm²

2000 s/mm²

1

1

On Off Off Off On Off 40

**Diff - Body**

**Diff - Body**

b-value 2

Diff. weighted images Trace weighted images ADC maps

Exponential ADC Maps FA maps

Invert Gray Scale Calculated Image b-Value >=

Noise level

1

On Off Off Off Off Off Off

0 s/mm²

40

**Diff - Composing**

Distortion Corr. Off

**Sequence - Part 1**

Introduction Multi-slice mode

Free echo spacing Echo spacing

Bandwidth

Off Interleaved Off

0.67 ms

1780 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

104

Fast Standard Off

**Sequence - Special**

Excite pulse duration Refocus pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble Time-shifted MB RF SENSE1 coil combine Invert RO/PE polarity PF omits higher k-space Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

5120 us

10240 us

On Off Off Off Off On Off Off Off Off Online 1.00

Off

Diffusion mode Diff. directions Diffusion Scheme Diff. weightings

b-value 1

b-value 2

b-value 1

Free 104

Monopolar 2

0 s/mm²

2000 s/mm²

1

TA: 0:11 PM: REF Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB4\_v2\_clippi ng\_check**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| TE | 32.40 ms |
| Multi-band accel. factor | 4 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

1355 ms

32.40 ms

Off None 70 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 1

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr.

Prescan Normalize

Off

Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 4 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

REF H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment

Assume Dominant Fat

PAT mode None

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

Position Orientation Rotation

A >> P R >> L F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

0.00 deg

192 mm

192 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 1355 ms

4

**BOLD**

**Sequence - Part 1**

Introduction Contrasts Flow comp.

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Off 1

No Interleaved Off

0.55 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

1

0 ms Off

TA: 4:24 PM: REF Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB4\_v2\_PRF \_ mapping\_1**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| TE | 32.40 ms |
| Multi-band accel. factor | 4 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

1355 ms

32.40 ms

Off None 70 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 188

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr.

Prescan Normalize

Off

Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 4 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

REF H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment

Assume Dominant Fat

PAT mode None

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

Position Orientation Rotation

A >> P R >> L F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

0.00 deg

192 mm

192 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 1355 ms

4

**BOLD**

**Sequence - Part 1**

Introduction Contrasts Flow comp.

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Off 1

No Interleaved Off

0.55 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

188

0 ms Off

TA: 4:24 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_ mapping \_2**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| TE | 32.40 ms |
| Multi-band accel. factor | 4 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

1355 ms

32.40 ms

Off None 70 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 188

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr.

Prescan Normalize

Off

Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 4 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment

Assume Dominant Fat

PAT mode None

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

! Position

! Orientation

! Rotation

! A >> P

! R >> L

! F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

0.00 deg

192 mm

192 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 1355 ms

4

**BOLD**

**Sequence - Part 1**

Introduction Contrasts Flow comp.

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Off 1

No Interleaved Off

0.55 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

188

0 ms Off

TA: 4:24 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_ mapping\_3**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| TE | 32.40 ms |
| Multi-band accel. factor | 4 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

1355 ms

32.40 ms

Off None 70 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 188

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr.

Prescan Normalize

Off

Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 4 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment

Assume Dominant Fat

PAT mode None

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

! Position

! Orientation

! Rotation

! A >> P

! R >> L

! F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

0.00 deg

192 mm

192 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 1355 ms

4

**BOLD**

**Sequence - Part 1**

Introduction Contrasts Flow comp.

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Off 1

No Interleaved Off

0.55 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

188

0 ms Off

TA: 4:24 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB4\_v2\_PRF\_ mapping\_4**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| TE | 32.40 ms |
| Multi-band accel. factor | 4 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

1355 ms

32.40 ms

Off None 70 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 188

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

**Resolution - Filter Image**

Distortion Corr.

Prescan Normalize

Off

Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 1355 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 4 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment

Assume Dominant Fat

PAT mode None

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

! Position

! Orientation

! Rotation

! A >> P

! R >> L

! F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

0.00 deg

192 mm

192 mm

144 mm Off

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 1355 ms

4

**BOLD**

**Sequence - Part 1**

Introduction Contrasts Flow comp.

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Off 1

No Interleaved Off

0.55 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

188

0 ms Off

TA: 1:34 PM: FIX Voxel size: 2.0×2.0×2.0 mmRel. SNR: 1.00 : fm\_r

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\fieldmap\_gre\_2mm\_mb**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 49 |
| Dist. factor | 50 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | R >> L |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.0 mm |
| TR | 482.0 ms |
| TE 1 | 4.92 ms |
| TE 2 | 7.38 ms |
| Averages | 1 |
| Concatenations | 1 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE 1

TE 2 MTC

Flip angle

Fat suppr.

482.0 ms

4.92 ms

7.38 ms Off

46 deg

None

**Contrast - Dynamic**

Averages Averaging mode Reconstruction Measurements

Multiple series

1

Long term Magn./Phase 1

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.0 mm

96

100 %

Off Off

**Resolution - Filter Image**

**Resolution - Filter Image**

Prescan Normalize Normalize

B1 filter

Off Off

Off

**Resolution - Filter Rawdata**

Raw filter

Elliptical filter

Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 49 |
| Dist. factor | 50 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | R >> L |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.0 mm |
| TR | 482.0 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Concatenations | 1 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal R >> L |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 90.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

None

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Save uncombined Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Off

Off

---

Off - All

**System - Adjustments**

Standard TrueForm Off

Off

Off

B0 Shim mode B1 Shim mode

Adjust with body coil

Confirm freq. adjustment Assume Dominant Fat

Image Filter

Distortion Corr.

Off

Off

**System - Adjustments**

|  |
| --- |
| Assume Silicone Off  Adjustment Tolerance Auto |

**System - Adjust Volume**

Position Orientation Rotation

R >> L A >> P F >> H

Reset

L0.0 A15.0 H30.0 mm

Transversal

90.00 deg

192 mm

192 mm

146 mm Off

**System - pTx Volumes**

B1 Shim mode TrueForm

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Sequence - Part 1**

Introduction Dimension Asymmetric echo Contrasts

Flow comp. Multi-slice mode

Bandwidth

Off 2D

Off 2

Yes Interleaved

606 Hz/Px

**Sequence - Part 2**

RF pulse type Gradient mode

RF spoiling

Normal Fast

On

**Sequence - Assistant**

Mode Off

TA: 10:10 PM: FIX Voxel size: 2.0×2.0×2.0 mmPAT: Off Rel. SNR: 1.00 : epfid

**\\USER\FMRIB User\2024\_901 Visual Impairment \Protocol v6\bold\_mbep2d\_2mm\_MB6\_v2\_RS**

**Properties**

Off On Off On Off Off Off Off

Off

Prio recon

Load images to viewer Inline movie

Auto store images

Load images to stamp segments Load images to graphic segments Auto open inline display

Auto close inline display

Start measurement without further preparation

Wait for user to start Start measurements

**Routine**

On

Single measurement

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| AutoAlign | --- |
| Phase oversampling | 0 % |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 933 ms |
| TE | 33.40 ms |
| Multi-band accel. factor | 6 |
| Filter | None |
| Coil elements | HC1-7 |

**Contrast - Common**

TR TE MTC

Magn. preparation Flip angle

Fat suppr.

933 ms

33.40 ms

Off None 60 deg Fat sat.

**Contrast - Dynamic**

Averaging mode Reconstruction Measurements Delay in TR

Multiple series

Long term Magnitude 644

0 ms

Off

**Resolution - Common**

FoV read FoV phase

Slice thickness Base resolution Phase resolution

Phase partial Fourier

Interpolation

192 mm

100.0 %

2.00 mm

96

100 %

Off Off

**Resolution - iPAT**

PAT mode None

**Resolution - Filter Image**

**Resolution - Filter Image**

Prescan Normalize Off

**Resolution - Filter Rawdata**

Raw filter Elliptical filter

Hamming

Off Off

Off

**Geometry - Common**

|  |  |
| --- | --- |
| Slice group | 1 |
| Slices | 72 |
| Dist. factor | 0 % |
| Position | L0.0 A15.0 H30.0 mm |
| Orientation | Transversal |
| Phase enc. dir. | A >> P |
| FoV read | 192 mm |
| FoV phase | 100.0 % |
| Slice thickness | 2.00 mm |
| TR | 933 ms |
| Multi-slice mode | Interleaved |
| Series | Interleaved |
| Multi-band accel. factor | 6 |

**Geometry - AutoAlign**

|  |  |
| --- | --- |
| Slice group | 1 |
| Position Orientation  Phase enc. dir. | L0.0 A15.0 H30.0 mm  Transversal A >> P |
| AutoAlign | --- |
| Initial Position | L0.0 A15.0 H30.0 |
| L | 0.0 mm |
| A | 15.0 mm |
| H | 30.0 mm |
| Initial Rotation | 0.00 deg |
| Initial Orientation | Transversal |

**Geometry - Saturation**

Fat suppr.

Special sat.

Fat sat.

None

**System - Miscellaneous**

Positioning mode Table position Table position MSMA

Sagittal Coronal Transversal

Coil Combine Mode Matrix Optimization AutoAlign

Coil Select Mode

FIX H

0 mm

S - C - T R >> L A >> P F >> H

Sum of Squares Performance

---

Off - All

**System - Adjustments**

Brain TrueForm Off

Off Off Off

Auto

B0 Shim mode B1 Shim mode

Adjust with body coil Confirm freq. adjustment Assume Dominant Fat Assume Silicone

Adjustment Tolerance

Distortion Corr. Off

**System - Adjust Volume**

|  |
| --- |
| Position L0.0 A15.0 H30.0 mm  Orientation Transversal  Rotation 0.00 deg  A >> P 192 mm  R >> L 192 mm  F >> H 144 mm  Reset Off |

**System - pTx Volumes**

B1 Shim mode

Excitation

TrueForm

Standard

**System - Tx/Rx**

Frequency 1H Correction factor Gain

Img. Scale Cor. Reset

? Ref. amplitude 1H

123.255752 MHz

1

High 1.000

Off

0.000 V

**Physio - Signal1**

1st Signal/Mode TR

Multi-band accel. factor

None 933 ms

6

**BOLD**

GLM Statistics Dynamic t-maps Ignore meas. at start Ignore after transition Model transition states Temp. highpass filter Threshold

Paradigm size Meas[1] Meas[2] Meas[3] Meas[4] Meas[5] Meas[6] Meas[7] Meas[8] Meas[9] Meas[10] Meas[11] Meas[12] Meas[13] Meas[14] Meas[15] Meas[16] Meas[17] Meas[18] Meas[19] Meas[20]

Motion correction

Spatial filter Measurements Delay in TR Multiple series

Off Off 0

0

Off Off 4.00

20

Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Baseline Active Active Active Active Active Active Active Active Active Active Off

Off

644

0 ms Off

**Sequence - Part 1**

**Sequence - Part 1**

Multi-slice mode Free echo spacing Echo spacing

Bandwidth

Interleaved Off

0.57 ms

2264 Hz/Px

**Sequence - Part 2**

EPI factor Gradient mode Excitation

RF spoiling

96

Performance Standard

Off

**Sequence - Special**

Excite pulse duration Single-band images MB LeakBlock kernel MB dual kernel

MB RF phase scramble SENSE1 coil combine Invert RO/PE polarity Disable freq. update Force equal slice timing Online multi-band recon. FFT scale factor

Physio recording

Triggering scheme

4880 us On

On Off Off Off Off Off Off Online 1.00

Off

Standard

Introduction Contrasts

Flow comp.

Off 1

No