| \\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\localizer_200V_nova | | | | | |
|--|----------|----------------------------|----------------|--------------|--|
| TA: 0:27 | PAT: Off | Voxel size: 1.2×1.1×3.0 mm | Rel. SNR: 1.00 | SIEMENS: gre | |

| Properties Prio Recon | Off | Phase resolution Phase partial Fourier | 90 % 6/8 |
|---------------------------|-----------------------------|--|------------------|
| Before measurement | - | Interpolation | |
| After measurement | _ | PAT mode | None |
| Load to viewer | On | Image Filter | Off |
| Inline movie | Off | Distortion Corr. | Off |
| Auto store images | On | Prescan Normalize | Off |
| Load to stamp segments | Off | Normalize | Off |
| Load images to graphic | Off | B1 filter | Off |
| segments | 0" | Raw filter | Off |
| Auto open inline display | Off | Elliptical filter | Off |
| Start measurement without | On | · · | |
| further preparation | 0" | Geometry | |
| Wait for user to start | Off | Multi-slice mode | Sequential |
| Start measurements | single | Series | Interleaved |
| Routine | | Saturation mode | Standard |
| Slice group 1 | | Special sat. | None |
| Slices | 5 | | |
| Dist. factor | 20 % | Table position | Н |
| Position | Isocenter | Table position | 0 mm |
| Orientation | Sagittal | Inline Composing | Off |
| Phase enc. dir. | A >> P | | |
| Rotation | 0.00 deg | Tim CT mode | Off |
| Slice group 2 | _ | System | |
| Slices | 5 | T1 | On |
| Dist. factor | 20 % | M2 | On |
| Position | Isocenter | B4 | On |
| Orientation | Coronal | M3 | On |
| Phase enc. dir. | R >> L | V32 | Off |
| Rotation | 0.00 deg | Docitioning made | EIV |
| Slice group 3 | _ | Positioning mode | FIX |
| Slices | 5 | MSMA Societal | S-C-T |
| Dist. factor | 20 % | Sagittal | R >> L A >> P |
| Position | Isocenter | Coronal | A >> P F >> H |
| Orientation | Transversal | Transversal Save uncombined | F >> FI On |
| Phase enc. dir. | A >> P | Coil Combine Mode | Sum of Squares |
| Rotation | 0.00 deg | AutoAlign | |
| Phase oversampling | 0 % | Auto Coil Select | Off |
| FoV read | 280 mm | Auto Coli Select | |
| FoV phase | 100.0 % | Shim mode | Tune up |
| Slice thickness | 3.0 mm | Adjust with body coil | Off |
| TR TE | 10.0 ms | Confirm freq. adjustment | Off |
| | 3.00 ms | Assume Silicone | Off |
| Averages Concatenations | 1 15 | ! Ref. amplitude 1H | 200.000 V |
| Filter | None | Adjustment Tolerance | Auto |
| Coil elements | B4;M2,3;T1 | Adjust volume | |
| 1 | ⊔ + ,1V1∠,∪, 1 1 | Position | Isocenter |
| Contrast | | Orientation | Transversal |
| TD | 0 ms | Rotation | 0.00 deg |
| MTC | Off | R >> L | 350 mm |
| Magn. preparation | None | A >> P | 263 mm |
| Flip angle | 10 deg | F >> H | 350 mm |
| Fat suppr. | None | Physio | |
| Water suppr. | None | 1st Signal/Mode | None |
| SWI | Off | Segments | 1 |
| Averaging mode | Short term | Tagging | None |
| Reconstruction | Magnitude | Tagging Dark blood | None Off |
| Measurements | 1 | Dark blood | OII |
| Multiple series | Each measurement | Resp. control | Off |
| Resolution | | Inline | |
| Base resolution | 256 | Subtract | Off |
| Dago resolution | 200 | Capitali | OII |

Sequence

| On |
|------------|
| 2D |
| Off |
| Allowed |
| 320 Hz/Px |
| No |
| Normal |
| Whisper |
| Slice-sel. |
| On |
| |

| \\USER\I | Feinberglab | \Suhyung\GRASE_IV_CS_G | GRASE\t1_mpr_sa | ag_p9mm_iso | |
|----------|-------------|----------------------------|-----------------|--------------|--|
| TA: 6:14 | PAT: Off | Voxel size: 0.9x0.9x0.9 mm | Rel. SNR: 1.00 | SIEMENS: tfl | |

| - | | Mode | Inplane |
|----------------------------------|-------------------|--|------------------|
| Properties | 0" | l | |
| Prio Recon | Off | Geometry | Cinalo obst |
| Before measurement | | Multi-slice mode Series | Single shot |
| After measurement Load to viewer | On | | Ascending |
| Inline movie | Off | Table position | Н |
| Auto store images | On | Table position Table position | П 0 mm |
| Load to stamp segments | Off | Inline Composing | Off |
| Load images to graphic | Off | | Oli |
| segments | . | System | |
| Auto open inline display | Off | 8CH | On |
| Start measurement without | On | Positioning mode | REF |
| further preparation | | MSMA | S-C-T |
| Wait for user to start | Off | Sagittal | R >> L |
| Start measurements | single | Coronal | A >> P |
| Routine | | Transversal | F >> H |
| Slab group 1 | | Save uncombined | Off |
| Slabs | 1 | Coil Combine Mode | Adaptive Combine |
| Dist. factor | 50 % | AutoAlign | · |
| Position | Isocenter | Auto Coil Select | Off |
| Orientation | Sagittal | Shim mode | Tupo up |
| Phase enc. dir. | A >> P | Shim mode | Tune up |
| Rotation | 0.00 deg | Adjust with body coil Confirm freq. adjustment | Off Off |
| Phase oversampling | 0 % | Assume Silicone | Off |
| Slice oversampling | 18.2 % | ? Ref. amplitude 1H | 0.000 V |
| Slices per slab | 176 | Adjustment Tolerance | Auto |
| FoV read | 230 mm | Adjust volume | Auto |
| FoV phase | 87.5 % | Position | Isocenter |
| Slice thickness | 0.90 mm | Orientation | Transversal |
| TR | 1900 ms | Rotation | 0.00 deg |
| TE | 2.16 ms | R >> L | 350 mm |
| Averages | 1 | A >> P | 263 mm |
| Concatenations | 1 | F >> H | 350 mm |
| Filter | Elliptical filter | ı | 330 11111 |
| Coil elements | 8CH | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | Non-sel. IR | Dark blood | Off |
| TI | 900 ms | | |
| Flip angle | 9 deg | Resp. control | Off |
| Fat suppr. | None | Inline | |
| Water suppr. | None | Subtract | Off |
| | | Std-Dev-Sag | Off |
| Averaging mode | Long term | Std-Dev-Cor | Off |
| Reconstruction | Magnitude | Std-Dev-Tra | Off |
| Measurements | Took management | Std-Dev-Time | Off |
| Multiple series | Each measurement | MIP-Sag | Off |
| Resolution | | MIP-Cor | Off |
| Base resolution | 256 | MIP-Tra | Off |
| Phase resolution | 100 % | MIP-Time | Off |
| Slice resolution | 100 % | Save original images | On |
| Phase partial Fourier | 7/8 | _ | |
| Slice partial Fourier | Off | Sequence | |
| Interpolation | Off | Introduction | On |
| PAT mode | None | Dimension | 3D |
| | | Elliptical scanning | Off |
| Image Filter | Off | Asymmetric echo | Allowed |
| Distortion Corr. | Off | Bandwidth | 200 Hz/Px |
| Prescan Normalize | Off | Flow comp. | No |
| Normalize | Off | Echo spacing | 6.3 ms |
| B1 filter | Off | RF pulse type | Normal |
| Raw filter | Off | Gradient mode | Normal |
| Elliptical filter | On | Excitation | Non-sel. |
| | | | |
| | | 3/71 | |

RF spoiling On

 $\verb|\USER\Feinberg| lab \Suhyung \GRASE_IV_CS_GRASE \b1map_200V_TR1000_nova| label{label} labell$

| TA: 1:09 | Voxel size: 3.9×3.9×5.0 mn | m Rel. SNR: 1.00 USER | : b1map_658 |
|---------------------------|----------------------------|--------------------------|-------------------|
| Properties | | M3 - V32 | On Off |
| Prio Recon | Off | | |
| Before measurement | | Positioning mode | FIX |
| After measurement | | MSMA | S - C - T |
| Load to viewer | On | Sagittal | R >> L |
| Inline movie | Off | Coronal | A >> P |
| Auto store images | On | Transversal | F >> H |
| Load to stamp segments | Off | Save uncombined | Off |
| Load images to graphic | Off | Coil Combine Mode | Adaptive Combine |
| segments | . | AutoAlign | |
| Auto open inline display | Off | Auto Coil Select | Default |
| Start measurement without | On | Auto Coli Select | |
| | Oli | Shim mode | Tune up |
| further preparation | 0# | Adjust with body coil | Off |
| Wait for user to start | Off | Confirm freq. adjustment | Off |
| Start measurements | single | Assume Silicone | Off |
| Routine | | ! Ref. amplitude 1H | 200.000 V |
| Slice group 1 | | Adjustment Tolerance | Auto |
| | 10 | | Auto |
| Slices Diet feeter | 10 100 % | Adjust volume | Incontor |
| Dist. factor | | Position | Isocenter |
| Position | R0.7 A36.4 H11.5 | Orientation | Transversal |
| Orientation | Transversal | Rotation | 0.00 deg |
| Phase enc. dir. | A >> P | R >> L | 350 mm |
| Rotation | 0.00 deg | A >> P | 263 mm |
| FoV read | 250 mm | F >> H | 350 mm |
| FoV phase | 100.0 % | 0 | |
| Slice thickness | 5 mm | Composing | |
| TR | 1000 ms | Sequence | |
| TE 1 | 14 ms | Contrasts | 2 |
| TE 2 | 14 ms | Bandwidth | 260.416667 Hz/Px |
| Averages | 1 | | 200.410007 112/FX |
| Filter | None | T1 Compensation | Mean T1 |
| Coil elements | | Mean T1 | 1000.0 ms |
| Con elements | B4;M2,3;T1 | Angles | 1 |
| Contrast | | Amplitude Weighting | Linear |
| Flip angle 1 | 90 deg | Scale Bar | Enabled |
| Flip angle 2 | 120 deg | Raw Data | Disabled |
| Flip angle 3 | 60 deg | Naw Bala | Diodolog |
| Flip angle 4 | 135 deg | | |
| Flip angle 5 | 45 deg | | |
| | 45 deg | | |
| Measurements | 1 | | |
| Resolution | | | |
| Base resolution | 64 | _ | |
| Phase resolution | 100 % | | |
| | | | |
| Raw filter | Off | | |
| Geometry | | _ | |
| Series | Interleaved | _ | |
| Novinctor 4 | | | |
| Navigator 1 | D0 0 D00 0 E40 0 | | |
| Position | R2.0 P26.3 F10.8 | | |
| Orientation | Transversal | | |
| Rotation | 0.00 deg | | |
| Base size phase | 50 mm | | |
| Base size read | 119 mm | | |
| Thickness | 50 mm | | |
| Table partition | | | |
| Table position | Н | | |
| Table position | 0 mm | | |
| Inline Composing | Off | | |
| System | | | |
| T1 | On | _ | |
| M2 | On | | |
| B4 | On | | |
| 1 | | 5/71 | |

 $\verb|\USER| Feinberglab| Suhyung GRASE_IV_CS_GRASE | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8 mm iso = TR4500 | mp2 rage = 0.8$

| | | | 0" |
|---|--------------------|--------------------------------|-------------------|
| roperties | | Image Filter | Off |
| Prio Recon | Off | Distortion Corr. | Off |
| Before measurement | <u> </u> | Prescan Normalize | Off |
| After measurement | | Normalize | Off |
| Load to viewer | On | B1 filter | Off |
| Inline movie | Off | Raw filter | Off |
| | | Elliptical filter | Off |
| Auto store images | On Off | Coordating | |
| Load to stamp segments | Off | Geometry | <u> </u> |
| Load images to graphic | Off | Multi-slice mode | Single shot |
| segments | | Series | Interleaved |
| Auto open inline display | Off | | |
| Start measurement without | On | Table position | Н |
| further preparation | | Table position | 0 mm |
| Wait for user to start | On | Inline Composing | Off |
| Start measurements | single | | |
| | 3 | System | |
| outine | | T1 | On |
| Slab group 1 | | M2 | On |
| Slabs | 1 | B4 | On |
| Dist. factor | 50 % | M3 | On |
| Position | L1.2 A25.6 F16.0 | V32 | Off |
| Orientation | Sagittal | | |
| Phase enc. dir. | H >> F | Positioning mode | FIX |
| Rotation | 90.00 deg | MSMA | S - C - T |
| Phase oversampling | 0 % | Sagittal | R >> L |
| Slice oversampling | 8.3 % | Coronal | A >> P |
| Slices per slab | 192 | Transversal | F >> H |
| FoV read | 206 mm | Save uncombined | Off |
| | | Coil Combine Mode | Adaptive Combine |
| FoV phase | 62.5 % | AutoAlign | |
| Slice thickness | 0.80 mm | Auto Coil Select | Default |
| TR | 4500 ms | | |
| TE | 3.32 ms | Shim mode | Standard |
| Averages | 1 | Adjust with body coil | Off |
| Concatenations | 1 | Confirm freq. adjustment | Off |
| Filter | None | Assume Silicone | Off |
| Coil elements | B4;M2,3;T1 | ! Ref. amplitude 1H | 230.000 V |
| | | Adjustment Tolerance | Auto |
| ontrast | | Adjust volume | 71010 |
| Magn. preparation | Non-sel. IR | ! Position | L1.9 A24.9 F9.3 |
| TI 1 | 1000 ms | | |
| TI 2 | 3200 ms | ! Orientation | Sagittal |
| Flip angle 1 | 4 deg | ! Rotation | 0.00 deg |
| Flip angle 2 | 4 deg | ! F >> H | 108 mm |
| Fat suppr. | Water excit. fast | ! A >> P | 160 mm |
| Water suppr. | None | ! R >> L | 127 mm |
| 2nd Inversion-Contrast | On | Physio | |
| | | Physio | None |
| Averaging mode | Long term | 1st Signal/Mode | None |
| Reconstruction | Magnitude | Dark blood | Off |
| Measurements | 1 | | <u> </u> |
| Multiple series | Each measurement | Resp. control | Off |
| • | | Inline | |
| esolution | | | 0# |
| Base resolution | 256 | Subtract | Off |
| Phase resolution | 100 % | Std-Dev-Sag | Off |
| | 100 % | Std-Dev-Cor | Off |
| Slice resolution | Off | Std-Dev-Tra | Off |
| | | Std-Dev-Time | Off |
| Phase partial Fourier | 6/8 | | |
| Phase partial Fourier Slice partial Fourier | 6/8 Off | MIP-Sag | Off |
| Phase partial Fourier Slice partial Fourier Interpolation | 6/8 Off | MIP-Sag MIP-Cor | Off Off |
| Phase partial Fourier Slice partial Fourier | | MIP-Cor | Off |
| Phase partial Fourier Slice partial Fourier Interpolation | Off | ··· MIP-Cor MIP-Tra | Off Off |
| Phase partial Fourier Slice partial Fourier Interpolation PAT mode | Off GRAPPA 3 | MIP-Cor MIP-Tra MIP-Time | Off Off Off |
| Phase partial Fourier Slice partial Fourier Interpolation PAT mode Accel. factor PE | Off GRAPPA | ··· MIP-Cor MIP-Tra | Off Off |

| Introduction Dimension Elliptical scanning Asymmetric echo Contrasts Bandwidth Flow comp. Echo spacing | On 3D Off Off 1 200 Hz/Px Slice 8.1 ms |
|--|---|
| RF pulse type Gradient mode Excitation RF spoiling | Fast Fast Non-sel. On |
| FFT Scale Factor Line/Partition Swap Homodyne Phase Filter Flat Image T1 Map Division Image ExtInvPulseOn OffResFreqInv Invflipangle | 200 % Off Off On On Off On Off On 970 |

TA: 6:00 PAT: Off Voxel size: 0.8x0.8x1.5 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | | Orientation | Coronal |
|--|--|---|---|
| Prio Recon | Off | Special sat. | None |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | 011 | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| | On | | |
| further preparation Wait for user to start | Off | Positioning mode | REF |
| | | MSMA | S-C-T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | — Transversal | F >> H |
| Slabs | 1 | Save uncombined | Off |
| Dist. factor | 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | | |
| Phase oversampling | 0.00 deg 0 % | Adjust with body coil | Off Off |
| | 0.0 % | Confirm freq. adjustment | Off |
| Slice oversampling | | Assume Silicone | Off |
| Slices per slab | 8 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 90.0 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | |
| Slice thickness | 1.50 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 37.58 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 12 mm |
| Coil elements | B4;M2,3;T1 | Dhysio | |
| Contrast | | Physio 1st Signal/Mode | None |
| Magn. preparation | None | <u> </u> | None |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Seguence | |
| Fat sat. mode | Strong | Sequence | 0" |
| | | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D |
| Reconstruction | Magnitude | Reordering | Centric |
| Measurements | 120 | Contrasts | 1 |
| Pause after meas. | 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| • | | Turbo factor | 5 |
| Resolution | | EPI factor | 28 |
| Base resolution | 44() | | Normal |
| | 112 | | |
| Phase resolution | 100 % | RF pulse type | |
| Slice resolution | 100 % 100 % | Gradient mode | Fast |
| Slice resolution Slice partial Fourier | 100 % 100 % 5/8 | Gradient mode | |
| Slice resolution | 100 % 100 % | Gradient mode refocussing type | Fast |
| Slice resolution Slice partial Fourier Interpolation | 100 % 100 % 5/8 Off | Gradient mode refocussing type flip angle excit | Fast sinc 2560 90 |
| Slice resolution Slice partial Fourier | 100 % 100 % 5/8 | Gradient mode refocussing type flip angle excit phase encoding | Fast sinc 2560 90 ON |
| Slice resolution Slice partial Fourier Interpolation PAT mode | 100 % 100 % 5/8 Off | Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | Fast sinc 2560 90 ON Off |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize | 100 % 100 % 5/8 Off None | Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | Fast sinc 2560 90 ON Off single |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 100 % 100 % 5/8 Off None | Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | Fast sinc 2560 90 ON Off single 0 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | 100 % 100 % 5/8 Off None Off Off | refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | Fast sinc 2560 90 ON Off single 0 2560 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 100 % 100 % 5/8 Off None | Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration | Fast sinc 2560 90 ON Off single 0 2560 2560 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 100 % 100 % 5/8 Off None Off Off | refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series Sat. region 1 | 100 % 100 % 5/8 Off None Off Off Interleaved | refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 8.0 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 100 % 100 % 5/8 Off None Off Off | refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| \\USER\Feinberglab\Suh | vung\GRASE IV CS | GRASE\BP gras | e IV Regular nSTE |
|------------------------|------------------|---------------|-------------------|
| | | | |

TA: 6:00 PAT: Off Voxel size: 0.8x0.8x1.5 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | O# | Orientation - Special sat. | Coronal None |
|---|--------------------------|---|---|
| Prio Recon Before measurement After measurement | Off | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 M3 | On |
| Auto open inline display | Off | | On Off |
| Start measurement without | On | V32 | OII |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| | | - Transversal | F >> H |
| Slab group 1 Slabs | 1 | Save uncombined | Off |
| | 1 0 % | Coil Combine Mode | Adaptive Combine |
| Dist. factor Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | | Oten dend |
| Rotation | | Shim mode | Standard |
| Phase oversampling | 0.00 deg 0 % | Adjust with body coil | Off |
| Slice oversampling | 0.0 % | Confirm freq. adjustment | Off |
| Slices per slab | 8 | Assume Silicone | Off |
| FoV read | 90.0 mm | ! Ref. amplitude 1H | 220.000 V |
| FoV phase | 25.0 % | Adjustment Tolerance | Auto |
| Slice thickness | 1.50 mm | Adjust volume | lacacatas |
| TR | 3000 ms | Position Orientation | Isocenter Transversal |
| TE | 37.58 ms | | |
| Averages | 1 | Rotation R >> L | 0.00 deg 90 mm |
| Concatenations | 1 | A >> L A >> P | 90 mm 23 mm |
| Filter | None | F >> H | |
| Coil elements | B4;M2,3;T1 | г>>п | 12 mm |
| John Clernerits | D+,1012,0,11 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | Composing | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D |
| Reconstruction | Magnitude | Reordering | Centric |
| Measurements | 120 | Contrasts | 1 |
| Pause after meas. | 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| | | Turbo factor | 5 |
| Resolution | 440 | - EPI factor | 28 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | 100 % | Gradient mode | Fast |
| Slice resolution | 100 % | | |
| Slice partial Fourier | 5/8 | refocussing type | sinc 2560 |
| Interpolation | O# | flip angle excit | 90 |
| | Off | | |
| PAT mode | Off None | phase encoding | ON |
| | None | phase encoding Maxwell compensation | ON Off |
| Prescan Normalize | None | phase encoding Maxwell compensation ICE program | ON Off single |
| | None | phase encoding Maxwell compensation ICE program prepscans | ON Off single 0 |
| Prescan Normalize Raw filter | None | phase encoding Maxwell compensation ICE program prepscans excite duration | ON Off single 0 2560 |
| Prescan Normalize Raw filter Geometry | None Off Off | phase encoding Maxwell compensation ICE program prepscans excite duration - refoc duration | ON Off single 0 2560 2560 |
| Prescan Normalize Raw filter Geometry Series | None | phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | ON Off single 0 2560 2560 12.0 |
| Prescan Normalize Raw filter Geometry Series Sat. region 1 | None Off Off Interleaved | phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | ON Off single 0 2560 2560 12.0 8.0 |
| Prescan Normalize Raw filter Geometry Series | None Off Off | phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 50000 |
|------------------------|-------|
| post-crusher2 | 25000 |
| post-crusher3 | 50000 |
| post-crusher4 | 25000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| \USER\Feinberglab\Suhyung\GRASE IV CS GRASE\BP grase IV Rec | \\USER\Feinberglab\Suhvi | na\GRASE IV | CS GRASE\BP | grase IV Regul |
|---|--------------------------|-------------|-------------|----------------|
|---|--------------------------|-------------|-------------|----------------|

TA: 6:00 PAT: Off Voxel size: 0.8x0.8x1.5 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties Prio Recon | Off | Orientation Special sat. | Coronal None |
|--|--|---|---|
| Before measurement After measurement | Oir | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | Transversal | F >> H |
| Slabs | 1 | Save uncombined | Off |
| Dist. factor | 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 8 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 90.0 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | . 13.15 |
| Slice thickness | 1.50 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 37.58 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 12 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | | None |
| Flip angle | 165 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| | | Dimension | 3D |
| Averaging mode | Long term | Reordering | Centric |
| Reconstruction | Magnitude | Contrasts | 1 |
| Measurements Pause after meas. | 120 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| • | OII | | |
| Resolution | | | |
| | | Turbo factor | 5 |
| Base resolution | 112 | EPI factor | 28 |
| Phase resolution | 100 % | EPI factor RF pulse type | 28 Normal |
| Phase resolution Slice resolution | 100 % 100 % | EPI factor | 28 |
| Phase resolution Slice resolution Slice partial Fourier | 100 % 100 % 5/8 | EPI factor RF pulse type Gradient mode refocussing type | 28 Normal Fast sinc 2560 |
| Phase resolution Slice resolution | 100 % 100 % | EPI factor RF pulse type Gradient mode refocussing type flip angle excit | 28 Normal Fast sinc 2560 90 |
| Phase resolution Slice resolution Slice partial Fourier | 100 % 100 % 5/8 | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 28 Normal Fast sinc 2560 90 ON |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | 100 % 100 % 5/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 28 Normal Fast sinc 2560 90 ON Off |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize | 100 % 100 % 5/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | 28 Normal Fast sinc 2560 90 ON Off single |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | 100 % 100 % 5/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | 28 Normal Fast sinc 2560 90 ON Off single 0 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 100 % 100 % 5/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | 28 Normal Fast sinc 2560 90 ON Off single 0 2560 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize | 100 % 100 % 5/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration | 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 100 % 100 % 5/8 Off None Off Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series Sat. region 1 | 100 % 100 % 5/8 Off None Off Off Interleaved | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 8.0 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 100 % 100 % 5/8 Off None Off Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| \\USER\Feinberglab\Suhyung\GRASE IV CS GRASE\BP grase IV Regular nSTE | \\USER\Feinberglab\Sul | vuna\GRASE IV (| CS GRASE\BP | grase IV | Regular nSTE |
|---|------------------------|-----------------|-------------|----------|--------------|
|---|------------------------|-----------------|-------------|----------|--------------|

TA: 6:00 PAT: Off Voxel size: 0.8x0.8x1.5 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | O# | Orientation Special sat. | Coronal None |
|--|--|---|---|
| Prio Recon Before measurement After measurement | Off | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| | | Transversal | F >> H |
| Slab group 1 Slabs | 1 | Save uncombined | Off |
| Dist. factor | 1 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 8 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 90.0 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | Auto |
| Slice thickness | 1.50 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 37.58 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 12 mm |
| Coil elements | B4;M2,3;T1 | ļ | |
| Contrast | | Physio | N. |
| | None | 1st Signal/Mode | None |
| Magn. preparation Flip angle | 165 deg | Composing | |
| Fat suppr. | Fat sat. | Commence | |
| Fat sat. mode | Strong | Sequence | 0" |
| | | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D Centric |
| Reconstruction | Magnitude | Reordering Contrasts | 1 |
| Measurements | 120 | Bandwidth | ı 1144 Hz/Px |
| Pause after meas. | 0.0 s | Echo spacing | 1 144 HZ/FX 1 ms |
| Multiple series | Off | | , IIIQ |
| Resolution | | Turbo factor | 5 |
| Base resolution | | EPI factor | 28 |
| | 112 | | |
| Phase resolution | 112 100 % | RF pulse type | Normal |
| Phase resolution Slice resolution | | | Normal Fast |
| | 100 % | RF pulse type Gradient mode | Fast |
| Slice resolution | 100 % 100 % | RF pulse type Gradient mode refocussing type | |
| Slice resolution Slice partial Fourier Interpolation | 100 % 100 % 5/8 Off | RF pulse type Gradient mode refocussing type flip angle excit | Fast sinc 2560 90 |
| Slice resolution Slice partial Fourier | 100 % 100 % 5/8 | RF pulse type Gradient mode refocussing type flip angle excit phase encoding | Fast sinc 2560 |
| Slice resolution Slice partial Fourier Interpolation | 100 % 100 % 5/8 Off | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | Fast sinc 2560 90 ON Off |
| Slice resolution Slice partial Fourier Interpolation PAT mode | 100 % 100 % 5/8 Off None | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | Fast sinc 2560 90 ON |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 100 % 100 % 5/8 Off None | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | Fast sinc 2560 90 ON Off single |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | 100 % 100 % 5/8 Off None Off Off | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | Fast sinc 2560 90 ON Off single 0 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 100 % 100 % 5/8 Off None | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | Fast sinc 2560 90 ON Off single 0 2560 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | 100 % 100 % 5/8 Off None Off Off | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration | Fast sinc 2560 90 ON Off single 0 2560 2560 |
| Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 100 % 100 % 5/8 Off None Off Off | RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 50000 |
|------------------------|-------|
| post-crusher2 | 25000 |
| post-crusher3 | 50000 |
| post-crusher4 | 25000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_IV_Regular_nSTE_T2map_ICEoff TA: 0:30 PAT: Off Voxel size: 0.8×0.8×3.0 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | | Prescan Normalize Raw filter | Off Off |
|--|----------------|---------------------------------|------------------|
| Prio Recon | Off | | |
| Before measurement | | Geometry | Interlegued |
| After measurement Load to viewer | 00 | Series | Interleaved |
| Inline movie | On Off | Sat. region 1 | |
| Auto store images | On | Thickness | 20 mm |
| Load to stamp segments | Off | Position | Isocenter |
| Load images to graphic | Off | Orientation | Coronal |
| segments | Oli | Special sat. | None |
| Auto open inline display | Off | Table position | Н |
| Start measurement without | On | Table position Table position | П 0 mm |
| further preparation | OII | Inline Composing | Off |
| Wait for user to start | Off | Inline Composing | Oli |
| Start measurements | single | System | |
| ı | Single | T1 | On |
| Routine | | M2 | On |
| Slab group 1 | | B4 | On |
| Slabs | 1 | M3 | On |
| Dist. factor | 0 % | V32 | Off |
| Position | Isocenter | Desitioning and | DEE |
| Orientation | Transversal | Positioning mode | REF |
| Phase enc. dir. | A >> P | MSMA | S-C-T |
| Rotation | 0.00 deg | Sagittal | R >> L |
| Phase oversampling | 0 % | Coronal | A >> P |
| Slice oversampling | 0.0 % | Transversal | F >> H |
| Slices per slab | 8 | Save uncombined | Off |
| FoV read | 90.0 mm | Coil Combine Mode | Adaptive Combine |
| FoV phase | 25.0 % | AutoAlign | D (): |
| Slice thickness | 3.00 mm | Auto Coil Select | Default |
| TR | 3000 ms | Shim mode | Standard |
| TE | 37.54 ms | Adjust with body coil | Off |
| Averages | 1 | Confirm freq. adjustment | Off |
| Concatenations | 1 | Assume Silicone | Off |
| Filter | None | ! Ref. amplitude 1H | 220.000 V |
| Coil elements | B4;M2,3;T1 | Adjustment Tolerance | Auto |
| Contrast | | Adjust volume | |
| Magn. preparation | None | Position | Isocenter |
| Flip angle | 165 deg | Orientation | Transversal |
| | Fat sat. | Rotation | 0.00 deg |
| Fat suppr. | | R >> L | 90 mm |
| Fat sat. mode | Strong | A >> P | 23 mm |
| Averaging mode | Long term | F >> H | 24 mm |
| Reconstruction | Magnitude | Dhyaia | |
| Measurements | 10 | Physio | N |
| Pause after meas. 1 | 0.0 s | 1st Signal/Mode | None |
| Pause after meas. 2 | 0.0 s | Composing | |
| Pause after meas. 3 | 0.0 s | | |
| Pause after meas. 4 | 0.0 s | Sequence | 0" |
| Pause after meas. 5 | 0.0 s | Introduction | Off |
| Pause after meas. 6 | 0.0 s | Dimension | 3D |
| Pause after meas. 7 | 0.0 s | Reordering | Centric |
| Pause after meas. 8 | 0.0 s | Contrasts | 1 |
| Pause after meas. 9 | 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| Resolution | | Turbo factor | 5 |
| | 112 | EPI factor | 28 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | 100 % 100 % | Gradient mode | Fast |
| Slice resolution | 1.00.70 | J. 33.3.11 111000 | |
| Clica partial Faurian | | | |
| Slice partial Fourier | 5/8 | refocussing type | sinc 2560 |
| Slice partial Fourier Interpolation | | flip angle excit | 90 |
| | 5/8 | | |

| ICE program | single |
|------------------------|--------|
| prepscans | 0 |
| excite duration | 2560 |
| refoc duration | 2560 |
| excite BWTP | 12.0 |
| refoc BWTP | 8.0 |
| T2 Validation | On |
| pre-crusher | 37500 |
| post-crusher1 | 50000 |
| post-crusher2 | 25000 |
| post-crusher3 | 50000 |
| post-crusher4 | 25000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\se_mc PAT: Off Voxel size: 1.0×1.0×5.0 mm Rel. SNR: 1.00 SIEME

TA: 2:12

SIEMENS: se_mc

| Properties | | Special sat. | None |
|---------------------------|-------------------|--------------------------|------------------|
| Prio Recon | Off | Table position | H |
| Before measurement | | Table position | 0 mm |
| After measurement | | Inline Composing | Off |
| Load to viewer | On | | |
| Inline movie | Off | System | |
| Auto store images | On | Positioning mode | REF |
| Load to stamp segments | Off | MSMA | S - C - T |
| Load images to graphic | Off | Sagittal | R >> L |
| segments | 011 | Coronal | A >> P |
| Auto open inline display | Off | Transversal | F >> H |
| Start measurement without | On | | Off |
| further preparation | OII | Save uncombined | |
| Wait for user to start | Off | Coil Combine Mode | Adaptive Combine |
| | | AutoAlign | D () |
| Start measurements | single | Auto Coil Select | Default |
| Routine | | Shim mode | Tune up |
| Slice group 1 | | Adjust with body coil | Off |
| Slices | 1 | Confirm freq. adjustment | Off |
| Dist. factor | 100 % | Assume Silicone | Off |
| Position | Isocenter | ? Ref. amplitude 1H | 0.000 V |
| Orientation | Transversal | Adjustment Tolerance | Auto |
| Phase enc. dir. | A >> P | Adjust volume | |
| Rotation | 0.00 deg | Position | Isocenter |
| Phase oversampling | 0 % | Orientation | Transversal |
| FoV read | 128 mm | Rotation | 0.00 deg |
| FoV phase | 100.0 % | R >> L | 350 mm |
| Slice thickness | 5.0 mm | A >> P | 263 mm |
| TR | 1000 ms | F >> H | 350 mm |
| TE | 13.0 ms | l | 300 11111 |
| Averages | 1 | Physio | |
| Concatenations | 1 | 1st Signal/Mode | None |
| Filter | None | Dark blood | |
| Coil elements | 140110 | l | Off |
| Contract | | Inline | |
| Contrast | 0" | Subtract | Off |
| MTC | Off | Liver registration | Off |
| Magn. preparation | None | Std-Dev-Sag | Off |
| Flip angle | 180 deg | Std-Dev-Cor | Off |
| Fat suppr. | None | Std-Dev-Tra | Off |
| Water suppr. | None | Std-Dev-Time | Off |
| Averaging mode | Short term | MIP-Sag | Off |
| Reconstruction | Magnitude | MIP-Cor | Off |
| Measurements | 1 | MIP-Tra | Off |
| Multiple series | Each measurement | MIP-Time | Off |
| • | Lacifileasurement | Save original images | On |
| Resolution | 100 | | |
| Base resolution | 128 | MapIt | None |
| Phase resolution | 100 % | Contrasts | 1 |
| Phase partial Fourier | Off | Soguence | |
| Interpolation | Off | Sequence | On |
| PAT mode | None | Introduction Bandwidth | On 130 Hz/Px |
| | | Allowed delay | 0 s |
| Image Filter | Off | | |
| Distortion Corr. | Off | RF pulse type | Low SAR |
| Prescan Normalize | Off | Gradient mode | Fast |
| Normalize | Off | ı | |
| B1 filter | Off | | |
| Raw filter | Off | | |
| Elliptical filter | Off | | |
| Geometry | | | |
| Multi-slice mode | Interleaved | | |
| Series | Interleaved | | |
| | | | |

| | \\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_IV_Regular | | | | |
|----------|--|----------------------------|----------------|------------------------------------|--|
| TA: 0:30 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_clean_IV_Regular_SH | |

| Dranavias | | Prescan Normalize | Off |
|---------------------------|--------------------------|--------------------------|-------------------|
| Properties | | Raw filter | Off |
| Prio Recon | Off | | |
| Before measurement | | Geometry | |
| After measurement | 0 | Series | Interleaved |
| Load to viewer | On Off | Sat. region 1 | |
| Inline movie | Off | Thickness | 20 mm |
| Auto store images | On | Position | Isocenter |
| Load to stamp segments | Off | Orientation | Coronal |
| Load images to graphic | Off | Special sat. | None |
| segments | 0# | | 1.1 |
| Auto open inline display | Off | Table position | Н |
| Start measurement without | On | Table position | 0 mm |
| further preparation | 0" | Inline Composing | Off |
| Wait for user to start | Off | System | |
| Start measurements | single | T1 | On |
| Routine | | M2 | On |
| Slab group 1 | _ | B4 | On |
| Slabs | 1 | M3 | On |
| Dist. factor | 0 % | V32 | Off |
| Position | Isocenter | | |
| Orientation | Transversal | Positioning mode | REF |
| Phase enc. dir. | A >> P | MSMA | S - C - T |
| Rotation | 0.00 deg | Sagittal | R >> L |
| Phase oversampling | 0 % | Coronal | A >> P |
| Slice oversampling | 0.0 % | Transversal | F >> H |
| Slices per slab | 8 | Save uncombined | Off |
| FoV read | 89.6 mm | Coil Combine Mode | Adaptive Combine |
| FoV phase | 25.0 % | AutoAlign | |
| Slice thickness | 0.80 mm | Auto Coil Select | Default |
| TR | 3000 ms | Shim mode | Standard |
| TE | 37.74 ms | Adjust with body coil | Off |
| Averages | 1 | Confirm freq. adjustment | Off |
| Concatenations | 1 | Assume Silicone | Off |
| Filter | None | ! Ref. amplitude 1H | 220.000 V |
| Coil elements | B4;M2,3;T1 | Adjustment Tolerance | 220.000 V Auto |
| _ | <i>_</i> ,, <u>_</u> ,0, | Adjust volume | Auto |
| Contrast | | Position | Isocenter |
| Magn. preparation | None | Orientation | Transversal |
| Flip angle | 180 deg | Rotation | 0.00 deg |
| Fat suppr. | Fat sat. | | |
| Fat sat. mode | Strong | R >> L A >> P | 90 mm 23 mm |
| Averaging mode | Long term | F>> H | 7 mm |
| Reconstruction | Magnitude | ' -> '' | 7 10111 |
| Measurements | 10 | Physio | |
| Pause after meas. 1 | 0.0 s | 1st Signal/Mode | None |
| Pause after meas. 2 | 0.0 s | Composing | |
| Pause after meas. 3 | 0.0 s | Composing | |
| Pause after meas. 4 | 0.0 s | Sequence | |
| Pause after meas. 5 | 0.0 s | Introduction | Off |
| Pause after meas. 6 | 0.0 s | Dimension | 3D |
| Pause after meas. 7 | 0.0 s | Reordering | Centric |
| Pause after meas. 8 | 0.0 s | Contrasts | 1 |
| Pause after meas. 9 | 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| | | | 6 |
| Resolution | | Turbo factor | 6 |
| Base resolution | 112 | EPI factor | 28 Normal |
| Phase resolution | 100 % | RF pulse type | Normal |
| Slice resolution | 100 % | Gradient mode | Fast |
| Slice partial Fourier | 6/8 | refocussing type | sinc 2560 |
| Interpolation | Off | flip angle excit | 90 |
| PAT mode | None | phase encoding | OFF |
| I AT HOUSE | 11011G | Maxwell compensation | Off |
| • | | 1 | |

| ICE program | single |
|------------------------|--------|
| prepscans | 0 |
| excite duration | 2560 |
| refoc duration | 2560 |
| excite BWTP | 12.0 |
| refoc BWTP | 8.0 |
| T2 Validation | Off |
| pre-crusher | 40000 |
| post-crusher1 | 40000 |
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |

| \\USFR\Feinberglab\Suhvung\ | GRASE IV C | S GRASE\RP | arase IV VFA |
|-----------------------------|------------|------------|--------------|

TA: 0:30 PAT: Off Voxel size: 0.8×0.8×0.8 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | | Prescan Normalize | Off |
|-------------------------------------|------------------------|----------------------------|------------------|
| Prio Recon | Off | Raw filter | Off |
| Before measurement | Oli | Geometry | |
| After measurement | | Series | Interleaved |
| Load to viewer | On | | |
| Inline movie | Off | Sat. region 1 | 00 |
| Auto store images | On | Thickness | 20 mm |
| Load to stamp segments | Off | Position | Isocenter |
| Load images to graphic | Off | Orientation | Coronal |
| segments | | Special sat. | None |
| Auto open inline display | Off | Table position | Н |
| Start measurement without | On | Table position | 0 mm |
| further preparation | | Inline Composing | Off |
| Wait for user to start | Off | System | |
| Start measurements | single | T1 | On |
| Routine | | M2 | On |
| Slab group 1 | | M2 B4 | On |
| Slabs | 1 | M3 | On |
| Dist. factor | 0 % | V32 | Off |
| Position | Isocenter | | |
| Orientation | Transversal | Positioning mode | REF |
| Phase enc. dir. | A >> P | MSMA | S-C-T |
| Rotation | 0.00 deg | Sagittal | R >> L |
| Phase oversampling | 0 % | Coronal | A >> P |
| Slice oversampling | 0.0 % | Transversal | F >> H |
| Slices per slab | 18 | Save uncombined | Off |
| FoV read | 89.6 mm | Coil Combine Mode | Adaptive Combine |
| FoV phase | 25.0 % | AutoAlign Auto Coil Select | Default |
| Slice thickness | 0.80 mm | Auto Coil Select | Default |
| TR | 3000 ms | Shim mode | Standard |
| TE | 37.74 ms | Adjust with body coil | Off |
| Averages | 1 | Confirm freq. adjustment | Off |
| Concatenations | 1 | Assume Silicone | Off |
| Filter | None | ! Ref. amplitude 1H | 220.000 V |
| Coil elements | B4;M2,3;T1 | Adjustment Tolerance | Auto |
| Contrast | | Adjust volume | |
| Magn. preparation | None | Position | Isocenter |
| Flip angle | 180 deg | Orientation | Transversal |
| Fat suppr. | Fat sat. | Rotation | 0.00 deg |
| Fat sat. mode | Strong | R >> L | 90 mm |
| Averaging mode | Long torm | A >> P | 23 mm |
| Averaging mode Reconstruction | Long term Magnitude | F >> H | 15 mm |
| Measurements | 10 | Physio | |
| Pause after meas. 1 | 0.0 s | 1st Signal/Mode | None |
| Pause after meas. 2 | 0.0 s | Composing | |
| Pause after meas. 3 | 0.0 s | Composing | |
| Pause after meas. 4 | 0.0 s | Sequence | |
| Pause after meas. 5 | 0.0 s | Introduction | Off |
| Pause after meas. 6 | 0.0 s | Dimension | 3D |
| Pause after meas. 7 | 0.0 s | Reordering | Centric |
| Pause after meas. 8 | 0.0 s | Contrasts | 1 |
| Pause after meas. 9 | 0.0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Echo spacing | 1 ms |
| | | Turbo factor | 14 |
| Resolution | 110 | EPI factor | 28 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | 100 % | Gradient mode | Fast |
| Slice resolution | 100 % | | |
| Slice partial Fourier Interpolation | 6/8 Off | refocussing type | variable sinc |
| interpolation | OII | flip angle excit | 90 |
| • | | phase encoding | OFF |
| PAT mode | None | Maxwell compensation | Off |

| ICE program | single |
|------------------------|--------|
| prepscans | 0 |
| excite duration | 2560 |
| refoc duration | 2560 |
| excite BWTP | 12.0 |
| refoc BWTP | 8.0 |
| T2 Validation | Off |
| pre-crusher | 40000 |
| post-crusher1 | 40000 |
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 90 |
| Variable Flip Angle 02 | 49 |
| Variable Flip Angle 03 | 45 |
| Variable Flip Angle 04 | 43 |
| Variable Flip Angle 05 | 43 |
| Variable Flip Angle 06 | 43 |
| Variable Flip Angle 07 | 42 |
| Variable Flip Angle 08 | 43 |
| Variable Flip Angle 09 | 46 |
| Variable Flip Angle 10 | 51 |
| Variable Flip Angle 11 | 58 |
| Variable Flip Angle 12 | 67 |
| Variable Flip Angle 13 | 77 |
| Variable Flip Angle 14 | 90 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |

 $\verb|\USER\Feinberg| lab| Suhyung \\ | GRASE_IV_CS_GRASE \\ | BP_grase_IV_CS_CFA_SL18_ETL06| \\$

| TA: 0:00 PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 USEF | R: BP_grase_IV_CS_SH |
|---|----------------------------|--|--------------------------------------|
| Dranartica | | Pause after meas. 20 | 0 s |
| Properties | 0" | Pause after meas. 21 | 0 s |
| Prio Recon | Off | Pause after meas. 22 | 0 s |
| Before measurement | | Pause after meas. 23 | 0 s |
| After measurement Load to viewer | On | Pause after meas. 24 | 0 s |
| Inline movie | Off | Pause after meas. 25 | 0 s |
| Auto store images | On | Pause after meas. 26 | 0 s |
| • | Off | Pause after meas. 27 | 0 s |
| Load to stamp segments Load images to graphic | Off | Pause after meas. 28 | 0 s |
| | Oii | Pause after meas. 29 | 0 s |
| segments Auto open inline display | Off | Pause after meas. 30 | 0 s |
| Start measurement without | On | Pause after meas. 31 | 0 s |
| | Oli | Pause after meas. 32 | 0 s |
| further preparation Wait for user to start | Off | Pause after meas. 33 | 0 s |
| Start measurements | | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas. 35 | 0 s |
| Routine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| Orientation | Transversal | Pause after meas, 41 | 0 s |
| Phase enc. dir. | A >> P | Pause after meas. 42 | 0 s |
| Rotation | 0 dea | Pause after meas. 43 | 0 s |
| Phase oversampling | 0 % | Pause after meas. 44 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas. 45 | 0 s |
| | 18 | Pause after meas. 46 | 0 s |
| Slices per slab FoV read | 90 mm | Pause after meas. 47 | 0 s |
| | | Multiple series | Off |
| FoV phase | 25.0 % | į | Oil |
| Slice thickness | 0.8 mm | Resolution | |
| TR | 3000 ms | Base resolution | 112 |
| TE | 22.82 ms | Phase resolution | 100 % |
| Averages | 1 | Slice resolution | 100 % |
| Concatenations | 1 | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | PAT mode | None |
| Contrast | | | |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | Geometry | |
| Fat sat. mode | Strong | | Interlegued |
| A | Law tame | Series | Interleaved |
| Averaging mode | Long term | Sat. region 1 | |
| Reconstruction | Magnitude | Thickness | 20 mm |
| Measurements | 48 | Position | Isocenter |
| Pause after meas. 1 | 0 s | Orientation | Coronal |
| Pause after meas. 2 | 0 s | Special sat. | None |
| Pause after meas. 3 | 0 s | | |
| Pause after meas. 4 | 0 s | Table position | Н |
| Pause after meas. 5 | 0 s | Table position | 0 mm |
| Pause after meas. 6 | 0 s | Inline Composing | Off |
| Pause after meas. 7 | 0 s | Cyatam | |
| Pause after meas. 8 | 0 s | System | 0.5 |
| Pause after meas. 9 | 0 s | T1 | On |
| Pause after meas. 10 | 0 s | M2 | On |
| | 0 s | B4 | On |
| Pause after meas. 11 | | M3 | On |
| Pause after meas. 11 Pause after meas. 12 | 0 s | | |
| | 0 s 0 s | V32 | Off |
| Pause after meas. 12 | | | |
| Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 | 0 s 0 s | Positioning mode | REF |
| Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 | 0 s 0 s 0 s | Positioning mode MSMA | REF S - C - T |
| Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s 0 s 0 s | Positioning mode MSMA Sagittal | REF S - C - T R >> L |
| Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 | 0 s 0 s 0 s 0 s | Positioning mode MSMA Sagittal Coronal | REF S - C - T R >> L A >> P |
| Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s 0 s 0 s | Positioning mode MSMA Sagittal | REF S - C - T R >> L |

| Coil Combine Mode | Adaptive Combine |
|--|--|
| AutoAlign Auto Coil Select | Default |
| Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ! Ref. amplitude 1H Adjustment Tolerance Adjust volume Position Orientation Rotation | Standard Off Off Off 220.000 V Auto Isocenter Transversal 0.00 deg |
| R >> L A >> P | 90 mm 23 mm |
| F >> H | 15 mm |
| Physio 1st Signal/Mode | None |
| Composing | |
| Sequence | |
| Introduction Dimension Reordering Contrasts Bandwidth | Off 3D Centric 1 1144 Hz/Px |
| Turbo factor EPI factor RF pulse type Gradient mode | 18 12 Normal Fast |
| refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 Variable Flip Angle 02 Variable Flip Angle 03 Variable Flip Angle 04 Variable Flip Angle 05 Variable Flip Angle 06 Variable Flip Angle 07 Variable Flip Angle 07 Variable Flip Angle 08 Variable Flip Angle 10 Variable Flip Angle 11 Variable Flip Angle 11 Variable Flip Angle 12 Variable Flip Angle 13 Variable Flip Angle 14 Crusher Gr | sinc 2560 90 OFF Off Single 0 6 2560 2560 12 8 180 180 180 180 180 180 180 180 180 1 |

 $\verb|\USER\Feinberg| lab| Suhyung \\ | GRASE_IV_CS_GRASE \\ | BP_grase_IV_CS_VFA_SL24_ETL10 \\ | IV_CS_VFA_SL24_ETL10 \\ | IV_$

| TA: 0:00 PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 USEF | R: BP_grase_IV_CS_SH |
|---|---|---|---|
| Properties | | Pause after meas. 20 | 0 s |
| Properties | 0" | Pause after meas. 21 | 0 s |
| Prio Recon | Off | Pause after meas. 22 | 0 s |
| Before measurement | | Pause after meas. 23 | 0 s |
| After measurement Load to viewer | On | Pause after meas. 24 | 0 s |
| Inline movie | Off | Pause after meas. 25 | 0 s |
| Auto store images | On | Pause after meas. 26 | 0 s |
| S . | Off | Pause after meas. 27 | 0 s |
| Load to stamp segments Load images to graphic | Off | Pause after meas. 28 | 0 s |
| | Oli | Pause after meas. 29 | 0 s |
| segments Auto open inline display | Off | Pause after meas. 30 | 0 s |
| Start measurement without | On | Pause after meas. 31 | 0 s |
| | OII | Pause after meas. 32 | 0 s |
| further preparation Wait for user to start | Off | Pause after meas. 33 | 0 s |
| Start measurements | | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas. 35 | 0 s |
| Routine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| Orientation | Transversal | Pause after meas. 41 | 0 s |
| Phase enc. dir. | A >> P | Pause after meas. 42 | 0 s |
| Rotation | 0 deg | Pause after meas, 43 | 0 s |
| Phase oversampling | 0 % | Pause after meas. 44 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas. 45 | 0 s |
| Slices per slab | 24 | Pause after meas. 46 | 0 s |
| FoV read | 89.6 mm | Pause after meas. 47 | 0 s |
| FoV phase | 25.0 % | Multiple series | Off |
| Slice thickness | 0.8 mm | • | O.I. |
| TR | 3000 ms | Resolution | |
| TE | 22.82 ms | Base resolution | 112 |
| | 22.02 IIIS 1 | Phase resolution | 100 % |
| Averages | • | Slice resolution | 100 % |
| Concatenations | 1 Nana | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | PAT mode | None |
| Contrast | None | | Ο# |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | Geometry | |
| Fat sat. mode | Strong | Series | Interleaved |
| Averaging mode | Long term | | |
| Reconstruction | Magnitude | Sat. region 1 | |
| Measurements | 48 | Thickness | 20 mm |
| Pause after meas. 1 | 0 s | Position | Isocenter |
| Pause after meas. 2 | 0 s | Orientation | Coronal |
| Pause after meas. 3 | 0 s | Special sat. | None |
| Pause after meas. 4 | 0 S | Table position | Н |
| Pause after meas. 5 | 0 s | Table position | П 0 mm |
| | 0 s | | O mm Off |
| Palice after mose 6 | U O | Inline Composing | OII |
| Pause after meas. 6 | Λe | _ | |
| Pause after meas. 7 | 0 s | System | |
| Pause after meas. 7 Pause after meas. 8 | 0 s | System T1 | On |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 | 0 s 0 s | | On On |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 | 0 s 0 s 0 s | T1 | |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 | 0 s 0 s 0 s 0 s | T1 M2 | On On |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 | 0 s 0 s 0 s 0 s | T1 M2 B4 M3 | On On On |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 | 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 | On On On Off |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 Positioning mode | On On On Off REF |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 | On On On Off |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 Positioning mode | On On On Off REF S - C - T R >> L |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 Positioning mode MSMA | On On On Off REF S - C - T |
| Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | T1 M2 B4 M3 V32 Positioning mode MSMA Sagittal | On On On Off REF S - C - T R >> L |

| Coil Combine Mode | Adaptive Combine |
|---|--|
| AutoAlign Auto Coil Select | Default |
| Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ! Ref. amplitude 1H Adjustment Tolerance Adjust volume Position Orientation | Standard Off Off Off 220.000 V Auto Isocenter Transversal |
| Rotation | 0.00 deg |
| R >> L A >> P F >> H | 90 mm 23 mm 20 mm |
| Physio 1st Signal/Mode | None |
| Composing | None |
| Sequence | |
| Introduction Dimension Reordering Contrasts | Off 3D Centric 1 |
| Bandwidth | 1144 Hz/Px |
| Turbo factor EPI factor RF pulse type Gradient mode | 24 12 Normal Fast |
| refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 Variable Flip Angle 02 Variable Flip Angle 03 Variable Flip Angle 04 Variable Flip Angle 05 Variable Flip Angle 05 Variable Flip Angle 07 Variable Flip Angle 07 Variable Flip Angle 08 Variable Flip Angle 09 Variable Flip Angle 10 Variable Flip Angle 11 Variable Flip Angle 11 Variable Flip Angle 12 Variable Flip Angle 13 Variable Flip Angle 14 Crusher Gr | sinc 2560 90 OFF Off single 0 10 2560 2560 12 8 80 43 40 39 42 48 60 76 93 144 180 180 180 0 |

 $\verb|\USER\Fe| in berglab \Suhyung \GRASE_IV_CS_GRASE \BP_grase_IV_CS_VFA_SL36_ETL14| \\$

| | Voxel size: 0.8×0.8× | :0.8 mm Rel. SNR: 1.00 USEF | R: BP_grase_IV_CS_SH |
|---|----------------------|-----------------------------|----------------------|
| Proportion | | Pause after meas. 20 | 0 s |
| Properties | 0" | Pause after meas. 21 | 0 s |
| Prio Recon | Off | Pause after meas. 22 | 0 s |
| Before measurement | | Pause after meas. 23 | 0 s |
| After measurement | 0.5 | Pause after meas. 24 | 0 s |
| Load to viewer | On O# | Pause after meas. 25 | 0 s |
| Inline movie | Off | Pause after meas. 26 | 0 s |
| Auto store images | On Off | Pause after meas. 27 | 0 s |
| Load to stamp segments | Off Off | Pause after meas. 28 | 0 s |
| Load images to graphic | Oli | Pause after meas. 29 | 0 s |
| segments | 0# | Pause after meas. 30 | 0 s |
| Auto open inline display | Off | Pause after meas. 31 | 0 s |
| Start measurement without | On | Pause after meas. 32 | 0 s |
| further preparation | 0" | Pause after meas. 33 | 0 s |
| Wait for user to start | Off | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas. 35 | 0 s |
| Routine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| Orientation | Transversal | Pause after meas. 41 | 0 s |
| Phase enc. dir. | A >> P | Pause after meas. 42 | 0 s |
| Rotation | 0 dea | Pause after meas, 43 | 0 s |
| | 0 deg 0 % | Pause after meas. 44 | 0 s |
| Phase oversampling | | Pause after meas. 45 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas. 46 | 0 s |
| Slices per slab | 36 | Pause after meas. 47 | 0 s |
| FoV read | 89.6 mm | | Off |
| FoV phase | 25.0 % | Multiple series | Oli |
| Slice thickness | 0.8 mm | Resolution | |
| TR | 3000 ms | Base resolution | 112 |
| TE | 22.82 ms | Phase resolution | 100 % |
| Averages | 1 | Slice resolution | 100 % |
| Concatenations | 1 | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | PAT mode | None |
| Contrast | | | |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | Geometry | |
| Fat sat. mode | Strong | Series | Interleaved |
| Averaging mode | Long term | | |
| Averaging mode | | Sat. region 1 | |
| Reconstruction | Magnitude | Thickness | 20 mm |
| Measurements | 48 | Position | Isocenter |
| Pause after meas. 1 | 0 s | Orientation | Coronal |
| Pause after meas. 2 | 0 s | Special sat. | None |
| Pause after meas. 3 | 0 s | | |
| Pause after meas. 4 | 0 s | Table position | H |
| Pause after meas. 5 | 0 s | Table position | 0 mm |
| Pause after meas. 6 | 0 s | Inline Composing | Off |
| Pause after meas. 7 | 0 s | System | |
| Pause after meas. 8 | 0 s | T1 | On |
| Pause after meas. 9 | 0 s | | On On |
| Pause after meas. 10 | 0 s | M2 | On On |
| Pause after meas. 11 | 0 s | B4 | On |
| Pause after meas. 12 | 0 s | M3 | On Off |
| Pause after meas. 13 | 0 s | V32 | Off |
| Pause after meas. 14 | 0 s | Positioning mode | REF |
| Pause after meas. 15 | 0 s | MSMA | S-C-T |
| Pause after meas. 16 | 0 s | | 8 - C - 1 R >> L |
| Pause after meas. 17 | 0 s | Sagittal | |
| | 0 s | Coronal | A >> P F >> H |
| Pause affer meas 18 | | | |
| Pause after meas. 18 Pause after meas. 19 | 0 s | Transversal Save uncombined | г >> п Off |

| Coil Combine Mode AutoAlign Auto Coil Select Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ! Ref. amplitude 1H Adjustment Tolerance Adjust volume Position | Adaptive Combine Default Standard Off Off Off 220.000 V Auto Isocenter |
|--|---|
| Orientation Rotation R >> L A >> P F >> H | Transversal 0.00 deg 90 mm 23 mm 29 mm |
| Physio 1st Signal/Mode | None |
| Composing | |
| Sequence | |
| Introduction Dimension Reordering Contrasts Bandwidth | Off 3D Centric 1 1144 Hz/Px |
| Turbo factor EPI factor RF pulse type Gradient mode | 36 12 Normal Fast |
| refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 Variable Flip Angle 03 Variable Flip Angle 04 Variable Flip Angle 05 Variable Flip Angle 06 Variable Flip Angle 07 Variable Flip Angle 08 Variable Flip Angle 09 Variable Flip Angle 10 Variable Flip Angle 11 Variable Flip Angle 12 Variable Flip Angle 13 Variable Flip Angle 14 Crusher Gr | sinc 2560 90 OFF Off Single 0 14 2560 2560 12 8 80 39 36 34 35 36 39 42 48 54 64 76 130 180 0 |

TA: 4:36 PAT: Off Voxel size: 0.8×0.8×0.8 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Prior Page | 0# | Orientation — Special sat. | Coronal None |
|--|---|--|---|
| Prio Recon Before measurement After measurement | Off | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | . | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S-C-T |
| Start measurements | single | Sagittal | R >> L |
| l | 5ig.5 | Coronal | A >> P |
| Routine | | Transversal | F >> H |
| Slab group 1 | | Save uncombined | Off |
| Slabs | 1 | Coil Combine Mode | |
| Dist. factor | 0 % | AutoAlign | Adaptive Combine |
| Position | Isocenter | Auto Coil Select | Default |
| Orientation | Transversal | Auto Coii Select | Delauli |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 8 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | |
| Slice thickness | 0.80 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 37.74 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 7 mm |
| Coil elements | B4;M2,3;T1 | ļ | 7 111111 |
| I | _ ,,,,., | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | Composing | |
| Flip angle | 180 deg | Composing | |
| Fat cuppr | | | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Fat sat. Strong | Sequence Introduction | Off |
| Fat sat. mode | Strong | | 3D |
| Fat sat. mode Averaging mode | Strong Long term | Introduction | |
| Fat sat. mode | Strong | Introduction Dimension Reordering Contrasts | 3D Centric 1 |
| Fat sat. mode Averaging mode Reconstruction Measurements | Strong Long term Magnitude 92 | Introduction Dimension Reordering Contrasts Bandwidth | 3D |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. | Strong Long term Magnitude 92 0.0 s | Introduction Dimension Reordering Contrasts | 3D Centric 1 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series | Strong Long term Magnitude 92 | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing | 3D Centric 1 1144 Hz/Px 1 ms |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution | Strong Long term Magnitude 92 0.0 s Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor | 3D Centric 1 1144 Hz/Px 1 ms |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution | Strong Long term Magnitude 92 0.0 s Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor | 3D Centric 1 1144 Hz/Px 1 ms |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution | Strong Long term Magnitude 92 0.0 s Off 112 100 % | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor | 3D Centric 1 1144 Hz/Px 1 ms |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 2560 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series Sat. region 1 | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off Off Interleaved | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 8.0 |
| Fat sat. mode Averaging mode Reconstruction Measurements Pause after meas. Multiple series Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | Strong Long term Magnitude 92 0.0 s Off 112 100 % 100 % 6/8 Off None Off Off | Introduction Dimension Reordering Contrasts Bandwidth Echo spacing Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 3D Centric 1 1144 Hz/Px 1 ms 6 28 Normal Fast sinc 2560 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| - //USEK/Feinberdiab/Sunvund/GKASE IV VS GKASE/DP diase IV | ER\Feinberglab\Suhyung\GRASE IV CS GRASE\BP grase IV | VFA |
|--|--|-----|
|--|--|-----|

TA: 4:36 PAT: Off Voxel size: 0.8×0.8×0.8 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | | Orientation | Coronal |
|---|--|---|---|
| Prio Recon | Off | — Special sat. | None |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | . | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | On | Docitioning mode | REF |
| Wait for user to start | Off | Positioning mode | |
| Start measurements | single | MSMA Sociital | S-C-T |
| Start measurements | Sirigie | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | — Transversal | F >> H |
| Slabs | 1 | Save uncombined | Off |
| Dist. factor | 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | D () |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 18 | | 220.000 V |
| FoV read | 89.6 mm | ! Ref. amplitude 1H | |
| FoV phase | 25.0 % | Adjustment Tolerance | Auto |
| Slice thickness | 0.80 mm | Adjust volume | |
| TR | 3000 ms | Position | Isocenter |
| | | Orientation | Transversal |
| TE | 37.74 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 15 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | _ - | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| | | Dimension | 3D |
| Averaging mode | Long term | Reordering | Centric |
| Reconstruction | Magnitude | Contrasts | 1 |
| Measurements | 92 | Bandwidth | 1 1144 Hz/Px |
| Pause after meas. | 0.0 s | | |
| Multiple series | Off | Echo spacing | 1 ms |
| | Oli | | |
| Resolution | Oli | Turbo factor | 14 |
| | | Turbo factor EPI factor | 14 28 |
| Base resolution | 112 | EPI factor | 28 |
| Base resolution Phase resolution | 112 100 % | | |
| Base resolution Phase resolution Slice resolution | 112 100 % 100 % | EPI factor RF pulse type Gradient mode | 28 Normal Fast |
| Base resolution Phase resolution Slice resolution Slice partial Fourier | 112 100 % 100 % 6/8 | EPI factor RF pulse type Gradient mode refocussing type | 28 Normal Fast variable sinc |
| Base resolution Phase resolution Slice resolution | 112 100 % 100 % | EPI factor RF pulse type Gradient mode refocussing type flip angle excit | 28 Normal Fast variable sinc 90 |
| Base resolution Phase resolution Slice resolution Slice partial Fourier | 112 100 % 100 % 6/8 | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 28 Normal Fast variable sinc 90 ON |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | 112 100 % 100 % 6/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 28 Normal Fast variable sinc 90 ON Off |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize | 112 100 % 100 % 6/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 28 Normal Fast variable sinc 90 ON |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | 112 100 % 100 % 6/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 28 Normal Fast variable sinc 90 ON Off |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 112 100 % 100 % 6/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | 28 Normal Fast variable sinc 90 ON Off single |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | 112 100 % 100 % 6/8 Off None Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | 28 Normal Fast variable sinc 90 ON Off single 0 |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | 112 100 % 100 % 6/8 Off None | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | 28 Normal Fast variable sinc 90 ON Off single 0 2560 |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 112 100 % 100 % 6/8 Off None Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 28 Normal Fast variable sinc 90 ON Off single 0 2560 2560 12.0 |
| Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series Sat. region 1 | 112 100 % 100 % 6/8 Off None Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | 28 Normal Fast variable sinc 90 ON Off single 0 2560 12.0 8.0 |
| Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | 112 100 % 100 % 6/8 Off None Off Off | EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 28 Normal Fast variable sinc 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 90 |
| Variable Flip Angle 02 | 49 |
| Variable Flip Angle 03 | 45 |
| Variable Flip Angle 04 | 43 |
| Variable Flip Angle 05 | 43 |
| Variable Flip Angle 06 | 43 |
| Variable Flip Angle 07 | 42 |
| Variable Flip Angle 08 | 43 |
| Variable Flip Angle 09 | 46 |
| Variable Flip Angle 10 | 51 |
| Variable Flip Angle 11 | 58 |
| Variable Flip Angle 12 | 67 |
| Variable Flip Angle 13 | 77 |
| Variable Flip Angle 14 | 90 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |

| \\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_IV_CS_CFA_SL18_ETL06 | | | | _IV_CS_CFA_SL18_ETL06 |
|--|----------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties | | Orientation Special sat. | Coronal None |
|-----------------------------|-----------------------|--------------------------|------------------|
| Prio Recon | Off | | |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | System | |
| Auto store images | On | T1 | On |
| Load to stamp segments | Off | M2 | On |
| Load images to graphic | Off | B4 | On |
| segments | | M3 | On |
| Auto open inline display | Off | V32 | Off |
| Start measurement without | On | V 02 | |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| | | — Transversal | F >> H |
| Slab group 1 Slabs | 1 | Save uncombined | Off |
| Dist. factor | 1 0 % | Coil Combine Mode | Adaptive Combine |
| | | AutoAlign | ' |
| Position | Isocenter | Auto Coil Select | Default |
| Orientation Phase enc. dir. | Transversal A >> P | | 04 |
| | | Shim mode | Standard |
| Rotation | 0 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 18 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | |
| Slice thickness | 0.8 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 22.82 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 15 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | | 140110 |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| | | Dimension | 3D |
| Averaging mode | Long term | Reordering | Centric |
| Reconstruction | Magnitude | Contrasts | 1 |
| Measurements | 92 | Bandwidth | 1 11/1/ ∐→/Dy |
| Pause after meas. | 0 s | Danuwiuti | 1144 Hz/Px |
| Multiple series | Off | Turbo factor | 18 |
| Resolution | | EPI factor | 12 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | 100 % | Gradient mode | Fast |
| Slice resolution | 100 % | | -: 0500 |
| Slice partial Fourier | Off | refocussing type | sinc 2560 |
| Interpolation | Off | flip angle excit | 90 |
| | OII | phase encoding | ON |
| PAT mode | None | Maxwell compensation | Off |
| Droson Normaliza | | io program | single |
| Prescan Normalize | Off Off | prepscans | 0 |
| Raw filter | Off | actual ETL | 6 |
| Geometry | | excite duration | 2560 |
| Series | Interleaved | refoc duration | 2560 |
| | | excite BWTP | 12 |
| Sat. region 1 | | refoc BWTP | 8 |
| Thickness | 20 mm | Variable Flip Angle 01 | 180 |
| Position | Isocenter | Variable Flip Angle 02 | 180 |
| | | 33/71 | |

| Variable Flip Angle 03 | 180 |
|------------------------|-----|
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 120 |
| Variable Flip Angle 08 | 150 |
| Variable Flip Angle 09 | 170 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_IV_CS_VFA_SL24_ETL10 | | | | |
|--|----------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties | | Orientation Special sat. | Coronal None |
|---------------------------|--------------|---|------------------|
| Prio Recon | Off | | |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | System | |
| Auto store images | On | System | 0.5 |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | . | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| l | Single | Coronal | A >> P |
| Routine | | - Transversal | F >> H |
| Slab group 1 | | Save uncombined | Off |
| Slabs | 1 | Coil Combine Mode | |
| Dist. factor | 0 % | | Adaptive Combine |
| Position | Isocenter | AutoAlign | Defends |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 24 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | Adio |
| Slice thickness | 0.8 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 22.82 ms | | |
| '= | 1 | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | l None | A >> P | 23 mm |
| Filter | None | F >> H | 20 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | - 1 | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | | Off |
| | | Introduction Dimension | Off 3D |
| Averaging mode | Long term | | Centric |
| Reconstruction | Magnitude | Reordering | 4 |
| Measurements | 92 | Contrasts | I 1144 ⊟→/D∨ |
| Pause after meas. | 0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Turbo factor | 24 |
| Resolution | | EPI factor | 12 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | | Gradient mode | Fast |
| Slice resolution | 100 % | | |
| | 100 % | refocussing type | sinc 2560 |
| Slice partial Fourier | Off | flip angle excit | 90 |
| Interpolation | Off | phase encoding | ON |
| PAT mode | None | Maxwell compensation | Off |
| | | ICE program | single |
| Prescan Normalize | Off | prepscans | 0 |
| Raw filter | Off | actual ETL | 10 |
| Goomotry | | excite duration | 2560 |
| Geometry | Interiory of | refoc duration | 2560 |
| Series | Interleaved | excite BWTP | 12 |
| Sat. region 1 | | refoc BWTP | 8 |
| Thickness | 20 mm | Variable Flip Angle 01 | 80 |
| Position | Isocenter | Variable Flip Angle 01 Variable Flip Angle 02 | 43 |
| 1 00111011 | 1000011101 | Variable i lip / liigie 02 | 10 |

| Variable Flip Angle 03 | 40 |
|------------------------|-----|
| Variable Flip Angle 04 | 39 |
| Variable Flip Angle 05 | 42 |
| Variable Flip Angle 06 | 48 |
| Variable Flip Angle 07 | 60 |
| Variable Flip Angle 08 | 76 |
| Variable Flip Angle 09 | 93 |
| Variable Flip Angle 10 | 144 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \\USER\ | Feinberglab | o\Suhyung\GRASE_IV_CS_0 | SRASE∖BP_grase | _IV_CS_VFA_SL36_ETL14 |
|----------|-------------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties | | | Orientation | Coronal |
|--|--------------------|-------------|--------------------------|------------|
| Price Recon Defere measurement After mea | • | | | |
| After measurement Load to viewer On Inline movie Off Auto store images On TTT On On On On On O | | Off | | |
| Load to tweer | | | | |
| Inline movie | | _ | | • |
| Auto store images | | | Inline Composing | Off |
| Ti | | _ | Svstem | |
| Load insages to graphic Off Segments Off Segments Auto open inline display Off Start measurement without further preparation Walt for user to start Off Positioning mode REF MSMA S - C - T Start measurements without further preparation V32 Off MSMA S - C - T Start measurements Single Start measurements St | | - | | On |
| Bat | | _ | | |
| Auto open inline display | | Oπ | B4 | |
| Vision V | | 0" | M3 | On |
| Further preparation Wait for user to start Start measurements Single Sagittal R >> L | | - | V32 | |
| Wait for user to start | | On | | |
| Salt measurements | | 0# | | |
| Routine | | | | |
| Slab group 1 | Start measurements | single | | |
| Salb group 1 | Routine | | | |
| Dist. factor | Slab group 1 | | | |
| Dist. factor | | | | |
| Postulation | | 0 % | | |
| Phase enc. dir. A >> P Shim mode Standard | | | | |
| Rotation | | | Auto Coli Gelect | |
| Phase oversampling | | | Shim mode | Standard |
| Silce oversampling | | | Adjust with body coil | Off |
| Silicos per slab 36 | | | | |
| FoV read | | | | _ |
| FoV phase 25.0 % Slice thickness 0.8 mm Position Isocenter | | | | 220.000 V |
| Silice thickness 0.8 mm | | | | Auto |
| TR 3000 ms Orientation Transversal TE 22.82 ms Rotation 0.00 deg Averages 1 R.>L 90 mm Concatenations 1 R.>P 29 mm Filter None F.>H 29 mm Coll elements B4;M2,3;T1 Physio Contrast Tender Tender None None Magn, preparation None Composing None Flip angle 180 deg Composing None Fat suppr. Fat sat. Sequence Factsat. Fat suppr. Fat sat. Sequence Factoric Averaging mode Long term Recolution Off Massurements 92 Contrasts 1 Pause after meas. 0 s Bandwidth 1144 Hz/px Multiple series Off Turbo factor 36 Resolution 112 RF pulse type Normal Phase resolution 100 % Fast <tr< td=""><td></td><td></td><td></td><td></td></tr<> | | | | |
| TE 22.82 ms Rotation 0.00 deg Averages 1 R >> L 90 mm Concatenations 1 A >> P 23 mm Filter None F >> H 29 mm Coll elements B4;M2,3;T1 Physio T >> H 29 mm Contract Magn, preparation None Composing None Composing Magn, preparation None Composing Sequence Composing Composing Fat sat, mode Strong Introduction Off Off Off Averaging mode Long term Sequence Sequence Faculty Contracts 1 Averaging mode Long term Recordering Centric Contracts 1 Pause after meas. 0 s Recordering Centric Contracts 1 1 Pause after meas. 0 s Bandwidth 1144 Hz/Px Natical Pick Text Turbo factor 36 EPI factor 12 Resolution Resolution 112 PResolution Prescator | | | | |
| Averages | | | Orientation | |
| Concatenations Filter None Filter None Filter None Filter None Filter Physio | | | | |
| Filter | | | | |
| Contrast | | · · | | |
| Physio | 1 - | | F >> H | 29 mm |
| Contrast Magn. preparation None Flip angle 180 deg Composing Fat suppr. Fat sat. Sequence Fat sat. mode Strong Introduction Off Averaging mode Long term Reordering Centric Measurements 92 Contrasts 1 Pause after meas. 0 s End of the properties 114 Hz/Px Multiple series Off Turbo factor 36 Resolution 112 Fast cator 12 Phase resolution 100 % Fast Normal Slice resolution 100 % Fast Fast Slice partial Fourier Off Interpolation Off Interpolation Off PAT mode None None Interpolation Off Interpolation Off Prescan Normalize Off Prescan Series Interleaved Interpolation Off Series Interleaved Interpolation 2560 2560 Series | Coll elements | B4;M2,3;11 | Physio | |
| Flip angle 180 deg Fat suppr. Fat sat. Fat sat. mode Strong Introduction Off Averaging mode Long term Reconstruction Magnitude Measurements 92 Pause after meas. 0 s Multiple series Off Base resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Perscan Normalize Raw filter Geometry Series Interleaved Strong Composing Sequence Sequence Introduction Off Dimension 3D Reordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 36 Fel factor 12 RF pulse type Normal Gradient mode Fast refocussing type sinc 2560 flip angle excit 90 Awawell compensation Off ICE program single prepscans 0 Awawell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 Felocited wration 2560 Sit region 1 Thickness 20 mm Variable Flip Angle 01 80 | Contrast | | | None |
| Fat suppr. Fat sat. mode Strong Averaging mode Reconstruction Measurements Pause after meas. Multiple series Off Phase resolution Slice partial Fourier Interpolation Off Off Off Off Off Dimension Reordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 12 RF pulse type Normal Gradient mode Fast Fats Fats Tefocussing type Filipangle Fats Fats Geometry Series Interleaved Sat. region 1 Thickness Sequence Introduction Off Dimension Sloequence Introduction Off Dimension Sloeguence Introduction Off Dimension Square Reordering Centric Contrasts 1 Turbo factor 36 EPI factor 12 RF pulse type Normal Gradient mode Fast Fats Normal Fast Fats Sequence Introduction Off Centric Contract Contrasts 1 Turbo factor 36 EPI factor 12 RF pulse type Normal Fast Off Fast Off Fast Fats Fats Sequence Introduction Off Centric Contract Contract Awarea Contract Turbo factor 12 RF pulse type Normal Fast Off Fast Off Fast Fats Off Ilie pangle excit 90 Interpolation Off ICE program single prepscans 0 Rawell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 refoc duration 2560 refoc duration 2560 refoc duration 2560 refoc duration 2560 Series Interleaved Sat. region 1 Thickness 20 mm Variable Flip Angle 01 80 | • | | Composing | |
| Fat sat. mode Strong Introduction Averaging mode Reconstruction Magnitude Measurements Pause after meas. Multiple series Off Resolution Base resolution Slice resolution Slice partial Fourier Interpolation Off Dimension Recordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor Repliated Recontrice Repliated Repliated Repliated Repliated Repliated Repliated Repliated Repliated Repliated Reportering Centric Contrasts 1 Reportering Reportering Centric Contrasts 1 Reportering Reportering Reportering Reportering Reportering Centric Contrasts 1 Reportering Reporteri | Flip angle | | Composing | |
| Averaging mode Reconstruction Magnitude Reconstruction Magnitude Measurements 92 Pause after meas. 0 s Multiple series Off Turbo factor 36 EPI factor 12 RF pulse type Normal Gradient mode Fast Plast ersolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Raw filter Off Series Interleaved Series Interleaved Series Survival Raw Filter Series Interleaved Series Survival Reconstruction SID Magnitude Reconstruction Magnitude Recording Contrasts 1 Recordering Centric Centric Central Recording Contrasts 1 Pandwidth 1144 Hz/Px Magnitude Central Series Interleaved Dimension 3D Recordering Centric Central Recordering Contrasts 1 Pandwidth 1144 Hz/Px Magnitude Central Series Survival Explanation 120 Recordering Contrasts 1 Pandwidth 1144 Hz/Px Magnitude Central Series Survival Explanation 120 Recordering Contrasts 1 Pandwidth 1144 Hz/Px Magnitude Central Security 36 Pandwidth 1144 Hz/P | | | Sequence | |
| Reconstruction Magnitude Neasurements Pause after meas. Multiple series Off Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation Off PAT mode None Prescan Normalize Resontry Series Interleaved Recontric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 36 EPI factor 12 RF pulse type Normal Gradient mode Fast refocussing type flip angle excit 90 Phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL excite duration excite duration 2560 sexcite BWTP 12 refoc BWTP 8 Turbo factor 12 RF pulse type Normal Fast Off RF pulse type Normal Fast Turbo factor 12 RF pulse type Normal Fast Turbo factor 12 RF pulse type Normal Fast Off IDE program single prepscans 0 actual ETL excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 | Fat sat. mode | Strong | Introduction | Off |
| Reconstruction Magnitude Measurements 92 Pause after meas. 0 s Multiple series Off Resolution Base resolution 112 Phase resolution 100 % Slice partial Fourier Off Interpolation Off Raw filter Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm Magnitude Reordering Contracts 1 Mandwidth 1144 Hz/Px Turbo factor 36 EPI factor 12 RF pulse type Normal Gradient mode Fast refocussing type sinc 2560 flip angle excit 90 phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | Averaging mode | Long term | Dimension | 3D |
| Measurements Pause after meas. Multiple series92Contrasts Bandwidth1 1144 Hz/PxResolutionTurbo factor EPI factor Resolution Phase resolution Slice partial Fourier Interpolation112 Off Off InterpolationRepl factor Fast12 RF pulse type Gradient modeNormal FastPAT mode Prescan Normalize Raw filterNonerefocussing type flip angle excit phase encoding phase encoding Nonesinc 2560 flip angle excit phase encoding DN Maxwell compensation ICE program actual ETL excite duration excite duration excite duration excite BWTP refoc BWTP refoc BWTP 8Sat. region 1 Thickness1144 Hz/PxContrasts Bandwidth1144 Hz/PxTurbo factor EPI factor Turbo factor 12 Repulse type Gradient mode refoccussing type flip angle excit phase encoding NAxwell compensation DN Maxwell compensation Off ICE program actual ETL excite duration excite BWTP refoc duration excite BWTP refoc BWTP 8 Variable Flip Angle 01 | | | Reordering | Centric |
| Pause after meas. Multiple series0 s OffBandwidth1144 Hz/PxResolutionTurbo factor EPI factor36 EPI factor12 RF pulse typeNormal Gradient modeBase resolution Slice resolution Slice partial Fourier Interpolation100 % Offrefocussing type flip angle excit phase encoding Maxwell compensation ICE program Prescan Normalize Raw filter90 ON Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 011144 Hz/PxSeriesInterleavedTurbo factor Series Flip factor 12 Turbo factor RF plactor 12 Turbo factor 12 RF pulse type Roormal Fast Plactor Normal Prefocussing type flip angle excit ymaxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 | | | Contrasts | 1 |
| Multiple seriesOffTurbo factor36Resolution112RF pulse typeNormalPhase resolution100 %Gradient modeFastSlice resolution100 %refocussing typesinc 2560Slice partial FourierOffflip angle excit90InterpolationOffphase encodingONPAT modeNoneMaxwell compensationOffPrescan NormalizeOffICE programsingleRaw filterOffactual ETL14GeometrySeriesInterleavedexcite duration2560Sat. region 1refoc BWTP12Thickness20 mmVariable Flip Angle 0180 | | | Bandwidth | 1144 Hz/Px |
| Resolution Base resolution 112 | | | Turbo factor | 36 |
| RF pulse type Normal Phase resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Maxwell compensation Off Prescan Normalize Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm RF pulse type Normal Fast Normal Fast Refocussing type sinc 2560 flip angle excit 90 Maxwell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 | | | | |
| Phase resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Raw filter Off Series Interleaved Series Interleaved Phase resolution 100 % refocussing type sinc 2560 flip angle excit 90 phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 refoc duration 2560 refoc duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | | 110 | | |
| Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm Prinase resolution 100 % refocussing type sinc 2560 flip angle excit 90 Maxwell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | | | | |
| Slice partial Fourier Off Interpolation Interpolation Off Interpolation Interpolation Off Interpolation Off Interpolation Interpolation Off Interpolation Of | | | | |
| Interpolation Off phase encoding off Maxwell compensation Off ICE program single prescan Normalize Off actual ETL 14 Geometry Series Interleaved Example Series Interleaved Stat. region 1 Thickness 20 mm Phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL 14 excite duration 2560 refor duration 2560 excite BWTP 12 refor BWTP 8 Variable Flip Angle 01 80 | | | | |
| PAT mode | | | | |
| Prescan Normalize Off prepscans 0 actual ETL 14 excite duration 2560 refoc duration 2560 excite BWTP 12 Sat. region 1 Thickness 20 mm Variable Flip Angle 01 80 | | | | |
| Prescan Normalize Off prepscans 0 Raw filter Off actual ETL 14 Geometry excite duration 2560 refoc duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | PAT mode | None | | |
| Raw filter Off actual ETL 14 Geometry excite duration 2560 Series Interleaved refoc duration 2560 Sat. region 1 refoc BWTP 12 Thickness 20 mm Variable Flip Angle 01 80 | Process Normaliza | Off | | • |
| Geometry excite duration 2560 Series Interleaved refoc duration 2560 Sat. region 1 excite BWTP 12 Thickness 20 mm Variable Flip Angle 01 80 | | | | |
| Series Interleaved refoc duration 2560 | Naw IIItei | Oil | | |
| Series Interieaved excite BWTP 12 Sat. region 1 refoc BWTP 8 Thickness 20 mm Variable Flip Angle 01 80 | Geometry | | | |
| Sat. region 1 refoc BWTP 8 Thickness 20 mm Variable Flip Angle 01 80 | Series | Interleaved | | |
| Thickness 20 mm Variable Flip Angle 01 80 | Sat ragion 1 | | | |
| | | 20 mm | | _ |
| valiable i ilp Aligie 02 33 | | | | |
| | 1 Goldon | IOOOOTILOI | Valiable I lip Aligle 02 | |

| Variable Flip Angle 03 | 36 |
|------------------------|-----|
| Variable Flip Angle 04 | 34 |
| Variable Flip Angle 05 | 35 |
| Variable Flip Angle 06 | 36 |
| Variable Flip Angle 07 | 39 |
| Variable Flip Angle 08 | 42 |
| Variable Flip Angle 09 | 48 |
| Variable Flip Angle 10 | 54 |
| Variable Flip Angle 11 | 64 |
| Variable Flip Angle 12 | 76 |
| Variable Flip Angle 13 | 130 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \\USER\ | Feinberglab | o\Suhyung\GRASE_IV_CS_0 | SRASE∖BP_grase | _IV_CS_VFA_SL48_ETL14 |
|----------|-------------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| | | l Orientation | Coronal |
|---|-------------|-----------------------------------|------------------|
| Properties | | Special sat. | None |
| Prio Recon | Off | | |
| Before measurement | | Table position | Н |
| After measurement | _ | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | System | |
| Auto store images | On | T1 | On |
| Load to stamp segments | Off | M2 | On |
| Load images to graphic | Off | B4 | On |
| segments | 0" | M3 | On |
| Auto open inline display | Off | V32 | Off |
| Start measurement without | On | | |
| further preparation | Off | Positioning mode | REF |
| Wait for user to start Start measurements | | MSMA | S-C-T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | Transversal | F >> H |
| Slabs | 1 | Save uncombined Coil Combine Mode | Off |
| Dist. factor | 0 % | | Adaptive Combine |
| Position | Isocenter | AutoAlign Auto Coil Select | Default |
| Orientation | Transversal | Auto Coil Select | Delaul |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 48 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | |
| Slice thickness | 0.8 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 22.82 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 39 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D |
| Averaging mode Reconstruction | Magnitude | Reordering | Centric |
| Measurements | 92 | Contrasts | 1 |
| Pause after meas. | 0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Trule of actor | 40 |
| | J., | Turbo factor EPI factor | 48 12 |
| Resolution | | RF pulse type | Normal |
| Base resolution | 112 | Gradient mode | Fast |
| Phase resolution | 100 % | | ı ası |
| Slice resolution | 100 % | refocussing type | sinc 2560 |
| Slice partial Fourier | Off | flip angle excit | 90 |
| Interpolation | Off | phase encoding | ON |
| PAT mode | None | Maxwell compensation | Off |
| | | ICE program | single |
| Prescan Normalize | Off | prepscans | 0 |
| Raw filter | Off | actual ETL | 14 |
| Geometry | | excite duration | 2560 |
| Series | Interleaved | refoc duration | 2560 |
| | | excite BWTP | 12 |
| Sat. region 1 | | refoc BWTP | 8 |
| Thickness | 20 mm | Variable Flip Angle 01 | 80 |
| Position | Isocenter | Variable Flip Angle 02 | 39 |
| | | 20/74 | |

| Variable Flip Angle 03 | 36 |
|------------------------|-----|
| Variable Flip Angle 04 | 34 |
| Variable Flip Angle 05 | 35 |
| Variable Flip Angle 06 | 36 |
| Variable Flip Angle 07 | 39 |
| Variable Flip Angle 08 | 42 |
| Variable Flip Angle 09 | 48 |
| Variable Flip Angle 10 | 54 |
| Variable Flip Angle 11 | 64 |
| Variable Flip Angle 12 | 76 |
| Variable Flip Angle 13 | 130 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \USER\Feinberglab\Suhyung\GRASE IV CS GRASE\BP grase IV Rec | \\USER\Feinberglab\Suhvi | na\GRASE IV | CS GRASE\BP | grase IV Regul |
|---|--------------------------|-------------|-------------|----------------|
|---|--------------------------|-------------|-------------|----------------|

TA: 8:00 PAT: Off Voxel size: 0.8x0.8x0.8 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | Off | Orientation Special sat. | Coronal None |
|---|-----------------------|------------------------------------|--------------------------|
| Prio Recon Before measurement After measurement | Off | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | 0.11 |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On O" |
| Start measurement without | On | V32 | Off |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| | | - Transversal | F >> H |
| Slab group 1 Slabs | 1 | Save uncombined | Off |
| Dist. factor | 1 0 % | Coil Combine Mode | Adaptive Combine |
| | | AutoAlign | · |
| Position | Isocenter | Auto Coil Select | Default |
| Orientation Phase enc. dir. | Transversal A >> P | Chim mada | Ctandard |
| Rotation | 0.00 deg | Shim mode | Standard |
| Phase oversampling | 0.00 deg 0 % | Adjust with body coil | Off |
| Slice oversampling | 0.0 % | Confirm freq. adjustment | Off |
| Slices per slab | 8 | Assume Silicone | Off |
| FoV read | 89.6 mm | ! Ref. amplitude 1H | 220.000 V |
| FoV fead FoV phase | 25.0 % | Adjustment Tolerance | Auto |
| Slice thickness | 0.80 mm | Adjust volume Position | laggantar |
| TR | 3000 ms | Orientation | Isocenter Transversal |
| TE | 37.74 ms | Rotation | |
| Averages | 1 | Rotation R >> L | 0.00 deg 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 7 mm |
| Coil elements | B4;M2,3;T1 | 1 >> 11 | 7 111111 |
| 1 | _ ',,'-,' ' | Physio | |
| Contrast | Nama | 1st Signal/Mode | None |
| Magn. preparation | None | Composing | |
| Flip angle | 180 deg | | |
| Fat suppr. Fat sat. mode | Fat sat. Strong | Sequence | ~ |
| Fat Sat. Houe | Strong | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D Contrin |
| Reconstruction | Magnitude | Reordering | Centric |
| Measurements | 160 | Contrasts | 1 1144 Hz/Dy |
| Pause after meas. | 0.0 s | Bandwidth Echo spacing | 1144 Hz/Px 1 ms |
| Multiple series | Off | | 1 1115 |
| Resolution | | Turbo factor | 6 |
| Base resolution | 112 | EPI factor | 28 |
| Phase resolution | 100 % | RF pulse type | Normal |
| Slice resolution | 100 % | Gradient mode | Fast |
| Slice partial Fourier | 6/8 | refocussing type | sinc 2560 |
| Interpolation | Off | flip angle excit | 90 |
| DAT mode | None | phase encoding | ON |
| PAT mode | None | Maxwell compensation | Off |
| Prescan Normalize | Off | ICE program | single |
| Raw filter | Off | prepscans | 0 |
| Geometry | _ | | |
| Ocometi y | | excite duration | 2560 |
| - | Interleaved | excite duration - refoc duration | 2560 2560 |
| Series | Interleaved | | |
| - | Interleaved | refoc duration | 2560 |
| Series | Interleaved 20 mm | refoc duration excite BWTP | 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 180 |
| Variable Flip Angle 02 | 180 |
| Variable Flip Angle 03 | 180 |
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 180 |
| Variable Flip Angle 08 | 180 |
| Variable Flip Angle 09 | 180 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| - //USEK/Feinberdiab/Sunvund/GKASE IV VS GKASE/DP diase IV | ER\Feinberglab\Suhyung\GRASE IV CS GRASE\BP grase IV | VFA |
|--|--|-----|
|--|--|-----|

TA: 8:00 PAT: Off Voxel size: 0.8x0.8x0.8 mm Rel. SNR: 1.00 USER: BP_grase_clean_IV_Regular_SH

| Properties | | Orientation | Coronal |
|---|--|--|--|
| Prio Recon | Off | Special sat. | None |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | . | B4 | On |
| Auto open inline display | Off | M3 | On |
| Start measurement without | On | V32 | Off |
| further preparation | 011 | Desitioning mode | REF |
| Wait for user to start | Off | Positioning mode | |
| Start measurements | single | MSMA | S-C-T |
| Start measurements | Sirigle | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | - Transversal | F >> H |
| Slabs | 1 | Save uncombined | Off |
| Dist. factor | 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | D () |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0.00 deg | Adjust with body coil | Off |
| Phase oversampling | 0.00 deg 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 18 | | 220.000 V |
| FoV read | 89.6 mm | ! Ref. amplitude 1H | |
| FoV phase | 25.0 % | Adjustment Tolerance | Auto |
| Slice thickness | 0.80 mm | Adjust volume | |
| TR | 3000 ms | Position | Isocenter |
| | | Orientation | Transversal |
| TE | 37.74 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 15 mm |
| Coil elements | B4;M2,3;T1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | = 1 | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| | | Dimension | 3D |
| Averaging mode | Long term | Reordering | Centric |
| Reconstruction | Magnitude | Contrasts | 1 |
| Measurements | 160 | Bandwidth | 1 1144 Hz/Px |
| Pause after meas. | 0.0 s | | |
| Multiple series | | | |
| Manapio domoo | Off | Echo spacing | 1 ms |
| • | | Turbo factor | 14 |
| Resolution | Off | | |
| Resolution Base resolution | Off 112 | Turbo factor EPI factor | 14 |
| Resolution Base resolution Phase resolution | Off 112 100 % | Turbo factor | 14 28 |
| Resolution Base resolution Phase resolution Slice resolution | Off 112 100 % 100 % | Turbo factor EPI factor RF pulse type Gradient mode | 14 28 Normal Fast |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier | Off 112 100 % 100 % 6/8 | Turbo factor EPI factor RF pulse type Gradient mode refocussing type | 14 28 Normal Fast variable sinc |
| Resolution Base resolution Phase resolution Slice resolution | Off 112 100 % 100 % | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit | 14 28 Normal Fast variable sinc 90 |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier | Off 112 100 % 100 % 6/8 | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 14 28 Normal Fast variable sinc 90 ON |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | Off 112 100 % 100 % 6/8 Off None | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 14 28 Normal Fast variable sinc 90 ON Off |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize | Off 112 100 % 100 % 6/8 Off None | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding | 14 28 Normal Fast variable sinc 90 ON |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode | Off 112 100 % 100 % 6/8 Off None | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation | 14 28 Normal Fast variable sinc 90 ON Off |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | Off 112 100 % 100 % 6/8 Off None | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program | 14 28 Normal Fast variable sinc 90 ON Off single |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry | Off 112 100 % 100 % 6/8 Off None Off Off | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans | 14 28 Normal Fast variable sinc 90 ON Off single 0 |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter | Off 112 100 % 100 % 6/8 Off None | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration | 14 28 Normal Fast variable sinc 90 ON Off single 0 2560 |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | Off 112 100 % 100 % 6/8 Off None Off Off | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 14 28 Normal Fast variable sinc 90 ON Off single 0 2560 2560 12.0 |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series Sat. region 1 | Off 112 100 % 100 % 6/8 Off None Off Off | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP refoc BWTP | 14 28 Normal Fast variable sinc 90 ON Off single 0 2560 2560 12.0 8.0 |
| Resolution Base resolution Phase resolution Slice resolution Slice partial Fourier Interpolation PAT mode Prescan Normalize Raw filter Geometry Series | Off 112 100 % 100 % 6/8 Off None Off Off Interleaved | Turbo factor EPI factor RF pulse type Gradient mode refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans excite duration refoc duration excite BWTP | 14 28 Normal Fast variable sinc 90 ON Off single 0 2560 2560 12.0 |

| post-crusher1 | 40000 |
|------------------------|-------|
| post-crusher2 | 40000 |
| post-crusher3 | 40000 |
| post-crusher4 | 40000 |
| Variable Flip Angle 01 | 90 |
| Variable Flip Angle 02 | 49 |
| Variable Flip Angle 03 | 45 |
| Variable Flip Angle 04 | 43 |
| Variable Flip Angle 05 | 43 |
| Variable Flip Angle 06 | 43 |
| Variable Flip Angle 07 | 42 |
| Variable Flip Angle 08 | 43 |
| Variable Flip Angle 09 | 46 |
| Variable Flip Angle 10 | 51 |
| Variable Flip Angle 11 | 58 |
| Variable Flip Angle 12 | 67 |
| Variable Flip Angle 13 | 77 |
| Variable Flip Angle 14 | 90 |
| Variable Flip Angle 15 | 180 |
| Variable Flip Angle 16 | 180 |
| Variable Flip Angle 17 | 180 |
| Variable Flip Angle 18 | 180 |
| Variable Flip Angle 19 | 180 |
| Variable Flip Angle 20 | 180 |
| | |

| \\USER\ | Feinberglab | o\Suhyung\GRASE_IV_CS_0 | SRASE\BP_grase | e_IV_CS_CFA_SL18_ETL06 |
|----------|-------------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties Prio Recon | Off | Orientation - Special sat. | Coronal None |
|--------------------------------------|-------------|---|-------------------------|
| Before measurement After measurement | Oii | Table position Table position | H 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | | |
| Auto store images | On | System | |
| Load to stamp segments | Off | T1 | On |
| Load images to graphic | Off | M2 | On |
| segments | | B4 | On |
| Auto open inline display | Off | M3 | On O# |
| Start measurement without | On | V32 | Off |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| | | - Transversal | F >> H |
| Slab group 1 Slabs | 1 | Save uncombined | Off |
| Dist. factor | 1 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0 deg | Adjust with body coil | Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 18 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | Adjustment Tolerance | Auto |
| FoV phase | 25.0 % | Adjust volume | Auto |
| Slice thickness | 0.8 mm | Position | Isocenter |
| TR | 3000 ms | Orientation | Transversal |
| TE | 22.82 ms | Rotation | 0.00 deg |
| Averages | 1 | R >> L | 90 mm |
| Concatenations | 1 | A >> P | 23 mm |
| Filter | None | F >> H | 15 mm |
| Coil elements | B4;M2,3;T1 | ļ | |
| Contract | | Physio | |
| Contrast | None | 1st Signal/Mode | None |
| Magn. preparation Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Common | |
| Fat sat. mode | Strong | Sequence | 0" |
| | | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D Centric |
| Reconstruction | Magnitude | Reordering Contrasts | 1 |
| Measurements | 160 | Bandwidth | ı 1144 Hz/Рх |
| Pause after meas. | 0 s | | |
| Multiple series | Off | Turbo factor | 18 |
| Resolution | | EPI factor | 12 |
| Base resolution | 112 | RF pulse type | Normal |
| Phase resolution | 100 % | Gradient mode | Fast |
| Slice resolution | 100 % | refocussing type | sinc 2560 |
| Slice partial Fourier | Off | flip angle excit | 90 |
| Interpolation | Off | phase encoding | ON |
| DAT mode | None | Maxwell compensation | Off |
| PAT mode | None | ICE program | single |
| | | | _ |
| Prescan Normalize | Off | prepscans | 0 |
| Prescan Normalize Raw filter | Off Off | prepscans actual ETL | 0 6 |
| Raw filter | _ | | |
| Raw filter Geometry | Off | actual ETL | 6 |
| Raw filter | _ | actual ETL excite duration refoc duration excite BWTP | 6 2560 |
| Raw filter Geometry | Off | actual ETL excite duration refoc duration | 6 2560 2560 |
| Raw filter Geometry Series | Off | actual ETL excite duration refoc duration excite BWTP | 6 2560 2560 12 |

| Variable Flip Angle 03 | 180 |
|------------------------|-----|
| Variable Flip Angle 04 | 180 |
| Variable Flip Angle 05 | 180 |
| Variable Flip Angle 06 | 180 |
| Variable Flip Angle 07 | 120 |
| Variable Flip Angle 08 | 150 |
| Variable Flip Angle 09 | 170 |
| Variable Flip Angle 10 | 180 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \\USER\ | Feinberglat | o\Suhyung\GRASE_IV_CS_G | SRASE∖BP_grase | e_IV_CS_VFA_SL24_ETL10 |
|----------|-------------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties | | | Orientation | Coronal |
|--|--------------------|--------------|--------------------------|------------|
| Price Recon Defere measurement After me | • | | | |
| After measurement Load to viewer On Inline movie Off Auto store images On TTT On On On On On O | | Off | | |
| Load to tweer | | | | |
| Inline movie | | _ | | |
| Auto store images | | | Inline Composing | Off |
| Ti | | _ | Svstem | |
| Load insages to graphic Off Segments Off Segments Auto open inline display Off Start measurement without further preparation Walt for user to start Off Positioning mode REF MSMA S - C - T Start measurements without further preparation Walt for user to start Off Positioning mode REF MSMA S - C - T Start measurements Single Stats Seguital A >> P Salgitial A >> P Transversal Siabs 1 Salgitial A >> P Transversal Siabs 1 Salgitial A >> P Transversal Auto Coil Select Default Adaptive Combine AutoAlign Adaptive Combine Adapti | | _ | | On |
| Bat | | _ | | _ |
| Auto open inline display | | Oπ | B4 | |
| Vision V | | 0" | M3 | On |
| Further preparation Wait for user to start Start measurements Single Sagittal R >> L | | _ | V32 | |
| Wait for user to start | | On | | |
| Salt measurements | | 0# | | |
| Routine | | | | |
| Slab group 1 | Start measurements | single | | |
| Salb group 1 | Routine | | | |
| Dist. factor | Slab group 1 | | | |
| Dist. factor | | | | |
| Postulation | | 0 % | | |
| Phase enc. dir. A >> P Shim mode Standard | | Isocenter | | |
| Rotation | | | Auto Odii Gelect | |
| Phase oversampling | | | | |
| Silce oversampling | | | | _ |
| Silicos per slab | | | | |
| FoV read | | | | _ |
| FoV phase 25.0 % Slice thickness 0.8 mm Position Isocenter | | = : | | 220.000 V |
| Silice thickness 0.8 mm | | | | Auto |
| TR 3000 ms Orientation Transversal TE 22.82 ms Rotation 0.00 deg Averages 1 R.>L 90 mm Concatenations 1 R.>P 20 mm Filter None F.>H 20 mm Coll elements B4;M2,3;T1 Physio Contrast Tender Tender None Physio Contrast None Composing None Pomposing Pomposing Contrast Strong Introduction Off Off Off Introduction Off Averaging mode Long term Reconstruction Reconstruction Magnitude Contrasts 1 Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Reconstruction Turb factor 24 Presconstruction Turb factor 24 Presconstruction Resolution 1144 Hz/px Presconstruction Resolution 112 Resolution Fast Presconstructi | | | | |
| TE | | | | |
| Averages | | | | |
| Concatenations Filter None Filter None Filter None Filter None Filter Physio | | | | |
| Filter | | | | |
| Contrast | | · · | | |
| Physio | | | F >> H | 20 mm |
| Contrast Magn. preparation None Flip angle 180 deg Composing Fat suppr. Fat sat. Sequence Fat sat. mode Strong Introduction Off Averaging mode Long term Bandwidth Centric Reconstruction Magnitude Contrasts 1 Measurements 160 Contrasts 1 Pause after meas. 0 s Bandwidth 1144 Hz/Px Multiple series Off Turbo factor 24 Resolution 112 Resolution 12 Phase resolution 100 % Gradient mode Fast Slice resolution 100 % refocussing type sinc 2560 Slice partial Fourier Off phase encoding ON Interpolation None ICE program Single Prescan Normalize Off Prescan Normalize Off Raw filter Off prepscans 0 Series Interleaved excite duration 2560 </td <td>Coll elements</td> <td>B4;IVI2,3;11</td> <td>Physio</td> <td></td> | Coll elements | B4;IVI2,3;11 | Physio | |
| Flip angle 180 deg Fat suppr. Fat sat. Fat sat. mode Strong Introduction Off Averaging mode Long term Reconstruction Magnitude Measurements 160 Pause after meas. 0 s Multiple series Off Base resolution 100 % Slice resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Persoan Normalize Raw filter Off Raw filter Off Series Interleaved Sat. region 1 Sat. region 1 Thickness 20 mm Sequence Sequence Sequence Introduction Off Dimension 3D Reordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 24 Fel factor 12 RF pulse type Normal Gradient mode Fast refocussing type sinc 2560 flip angle excit 90 None ICE program single prepscans 0 Raw filter Off actor 100 % ICE program 100 % ICE program 100 % ICE program 100 % ICE program 2560 Interleaved 2560 Interleaved 2560 Interleaved 2560 Interleaved 2560 Introduction Off I | Contrast | | | None |
| Fat suppr. Fat sat. mode Strong Averaging mode Reconstruction Measurements 160 Pause after meas. Multiple series Off Phase resolution Slice partial Fourier Interpolation Off Off Off Off Off Turbo factor EPI factor Slice partial Fourier Interpolation Off Off Off Off Off Off Off Off Off Of | . | | Composing | |
| Fat sat. mode Strong Introduction Averaging mode Reconstruction Magnitude Measurements 160 Pause after meas. Multiple series Off Resolution Base resolution Slice resolution Slice partial Fourier Interpolation Off Dimension Recordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 24 EPI factor Repulse type Normal Gradient mode Fast refocussing type flip angle excit 90 Interpolation Off PAT mode None Prescan Normalize Resolution Series Interleaved Series Interleaved Introduction Off Dimension Show Recordering Centric Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 24 EPI factor 12 RF pulse type Normal Gradient mode Fast Fast Prefocussing type flip angle excit 90 Maxwell compensation Off ICE program single prepscans 0 Actual ETL excite duration 2560 refoc BWTP 12 Thickness 20 mm Variable Flip Angle 01 80 | Flip angle | | Composing | |
| Averaging mode Reconstruction Magnitude Reconstruction Magnitude Measurements 160 Reordering Contrasts 1 Bandwidth 1144 Hz/Px Multiple series Off Turbo factor 24 EPI factor 12 Resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off Raw filter Off Raw filter Off Series Interleaved Series Interleaved Series Dimension 3D Reordering Centric Centrol | | | Sequence | |
| Reconstruction Magnitude Neasurements Neasurements Nultiple series Nultiple se | Fat sat. mode | Strong | Introduction | Off |
| Reconstruction Magnitude Measurements 160 Pause after meas. 0 s Multiple series Off Resolution Base resolution 112 Phase resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm Magnitude Contrasts 1 Bandwidth 1144 Hz/Px Turbo factor 24 EPI factor 12 RF pulse type Normal Gradient mode Fast refocussing type sinc 2560 flip angle excit 90 phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL 10 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | Averaging mode | Long term | Dimension | 3D |
| Measurements Pause after meas. Multiple series160 OffContrasts Bandwidth1 1144 Hz/PxResolutionTurbo factor EPI factor Resolution Phase resolution Slice partial Fourier Interpolation112 Off Off InterpolationRepulse type Gradient mode FastNormal FastPAT modeNonerefocussing type flip angle excit phase encoding Nonesinc 2560 flip angle excit phase encoding DN Maxwell compensation ICE program actual ETL excite duration excite BWTP refoc duration excite BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP refoc BWTP Variable Flip Angle 01 | | | Reordering | Centric |
| Pause after meas. Multiple series0 s OffBandwidth1144 Hz/PxResolution112 EPI factor24 EPI factor12 RF pulse typeNormal Gradient modeSlice resolution Slice partial Fourier Interpolation100 % Offrefocussing type flip angle excit phase encoding Maxwell compensationsinc 2560 flip angle excit phase encoding DN Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP ThicknessOff 2560 <td></td> <td></td> <td>Contrasts</td> <td>1</td> | | | Contrasts | 1 |
| Multiple seriesOffTurbo factor24Resolution112RF pulse typeNormalPhase resolution100 %Gradient modeFastSlice resolution100 %refocussing typesinc 2560Slice partial FourierOffflip angle excit90InterpolationOffphase encodingONPAT modeNoneMaxwell compensationOffPrescan NormalizeOffICE programsingleRaw filterOffactual ETL10GeometrySeriesInterleavedexcite duration2560Sat. region 1refoc BWTP12Thickness20 mmVariable Flip Angle 0180 | | | Bandwidth | 1144 Hz/Px |
| Resolution Base resolution 112 | | | Turbo factor | 24 |
| RF pulse type Normal Phase resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Maxwell compensation Off Prescan Normalize Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm RF pulse type Normal Fast Normal Fast Refocussing type sinc 2560 flip angle excit 90 Maxwell compensation Off ICE program single prepscans 0 actual ETL 10 excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 | | | | |
| Phase resolution 100 % Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Raw filter Off Series Interleaved Series Interleaved Phase resolution 100 % refocussing type sinc 2560 flip angle excit 90 phase encoding ON Maxwell compensation Off ICE program single prepscans 0 actual ETL 10 excite duration 2560 refoc duration 2560 refoc duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | | 112 | | |
| Slice resolution 100 % Slice partial Fourier Off Interpolation Off PAT mode None Prescan Normalize Off Raw filter Off Series Interleaved Sat. region 1 Thickness 20 mm Prinase resolution 100 % refocussing type sinc 2560 flip angle excit 90 Maxwell compensation Off ICE program single prepscans 0 actual ETL 10 excite duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | | | | |
| Slice partial Fourier Off Interpolation Interpolation Off Interpol | | | | |
| Interpolation Off phase encoding off Maxwell compensation Off ICE program single prescan Normalize Off actual ETL 10 excite duration 2560 excite BWTP 12 refoc BWTP 8 Thickness 20 mm Variable Flip Angle 01 80 | | | | |
| PAT mode | | | | |
| Prescan Normalize Off prepscans 0 actual ETL 10 excite duration 2560 excite BWTP 12 Sat. region 1 Thickness 20 mm ICE program single prepscans 0 actual ETL 10 excite duration 2560 excite BWTP 8 Variable Flip Angle 01 80 | | | | |
| Prescan Normalize Off prepscans 0 Raw filter Off actual ETL 10 Geometry excite duration 2560 refoc duration 2560 excite BWTP 12 refoc BWTP 8 Variable Flip Angle 01 80 | PAT mode | None | | |
| Raw filter Off actual ETL 10 Geometry excite duration 2560 Series Interleaved refoc duration 2560 Sat. region 1 refoc BWTP 12 Thickness 20 mm Variable Flip Angle 01 80 | Prescan Normaliza | Off | | 3 |
| Geometry excite duration 2560 Series Interleaved refoc duration 2560 Sat. region 1 refoc BWTP 12 Thickness 20 mm Variable Flip Angle 01 80 | | | | |
| Series Interleaved refoc duration 2560 | Naw IIIIei | Oii | | |
| Series Interieaved excite BWTP 12 Sat. region 1 refoc BWTP 8 Thickness 20 mm Variable Flip Angle 01 80 | Geometry | | | |
| Sat. region 1 refoc BWTP 8 Thickness 20 mm Variable Flip Angle 01 80 | Series | Interleaved | | |
| Thickness 20 mm Variable Flip Angle 01 80 | Sat ragion 1 | | | |
| | | 20 mm | | - |
| valiable i lip Aligie 02 45 | | _ | | |
| | 1 Goldon | iooonioi | Variable Filip Aligie 02 | |

| Variable Flip Angle 03 | 40 |
|------------------------|-----|
| Variable Flip Angle 04 | 39 |
| Variable Flip Angle 05 | 42 |
| Variable Flip Angle 06 | 48 |
| Variable Flip Angle 07 | 60 |
| Variable Flip Angle 08 | 76 |
| Variable Flip Angle 09 | 93 |
| Variable Flip Angle 10 | 144 |
| Variable Flip Angle 11 | 180 |
| Variable Flip Angle 12 | 180 |
| Variable Flip Angle 13 | 180 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |
| | |

| \\USER\ | Feinberglab | o\Suhyung\GRASE_IV_CS_0 | SRASE∖BP_grase | _IV_CS_VFA_SL36_ETL14 |
|----------|-------------|----------------------------|----------------|-------------------------|
| TA: 0:00 | PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 | USER: BP_grase_IV_CS_SH |

| Properties | | Orientation Special sat. | Coronal None |
|---------------------------|----------------|------------------------------------|--------------------------|
| Prio Recon | Off | | |
| Before measurement | | Table position | Н |
| After measurement | | Table position | 0 mm |
| Load to viewer | On | Inline Composing | Off |
| Inline movie | Off | System | |
| Auto store images | On | T1 | On |
| Load to stamp segments | Off | M2 | On |
| Load images to graphic | Off | B4 | On |
| segments | | M3 | On |
| Auto open inline display | Off | V32 | Off |
| Start measurement without | On | | |
| further preparation | | Positioning mode | REF |
| Wait for user to start | Off | MSMA | S - C - T |
| Start measurements | single | Sagittal | R >> L |
| Routine | | Coronal | A >> P |
| Slab group 1 | | — Transversal | F >> H |
| Slabs | 1 | Save uncombined | Off |
| Dist. factor | 0 % | Coil Combine Mode | Adaptive Combine |
| Position | Isocenter | AutoAlign | |
| Orientation | Transversal | Auto Coil Select | Default |
| Phase enc. dir. | A >> P | Shim mode | Standard |
| Rotation | 0 deg | Shim mode Adjust with body coil | Standard Off |
| Phase oversampling | 0 % | Confirm freq. adjustment | Off |
| Slice oversampling | 0.0 % | Assume Silicone | Off |
| Slices per slab | 36 | ! Ref. amplitude 1H | 220.000 V |
| FoV read | 89.6 mm | | Auto |
| FoV phase | 25.0 % | Adjustment Tolerance Adjust volume | Auto |
| Slice thickness | 0.8 mm | Position | laccenter |
| TR | 3000 ms | Orientation | Isocenter Transversal |
| TE | 22.82 ms | | |
| Averages | 1 | Rotation | 0.00 deg |
| Concatenations | 1 | R >> L A >> P | 90 mm 23 mm |
| Filter | None | F >> H | |
| Coil elements | B4;M2,3;T1 | г>>п | 29 mm |
| Con ciements | D-7,1012,0,1 1 | Physio | |
| Contrast | | 1st Signal/Mode | None |
| Magn. preparation | None | Composing | |
| Flip angle | 180 deg | Composing | |
| Fat suppr. | Fat sat. | Sequence | |
| Fat sat. mode | Strong | Introduction | Off |
| Averaging mode | Long term | Dimension | 3D |
| Reconstruction | Magnitude | Reordering | Centric |
| Measurements | 160 | Contrasts | 1 |
| Pause after meas. | 0 s | Bandwidth | 1144 Hz/Px |
| Multiple series | Off | Turbo factor | 36 |
| · · | | EPI factor | 36 12 |
| Resolution | | RF pulse type | Normal |
| Base resolution | 112 | Gradient mode | Fast |
| Phase resolution | 100 % | | ı ası |
| Slice resolution | 100 % | refocussing type | sinc 2560 |
| Slice partial Fourier | Off | flip angle excit | 90 |
| Interpolation | Off | phase encoding | ON |
| PAT mode | None | Maxwell compensation | Off |
| | | ICE program | single |
| Prescan Normalize | Off | prepscans | 0 |
| Raw filter | Off | actual ETL | 14 |
| Geometry | | excite duration | 2560 |
| Series | Interleaved | refoc duration | 2560 |
| | | excite BWTP | 12 |
| Sat. region 1 | | refoc BWTP | 8 |
| Thickness | 20 mm | Variable Flip Angle 01 | 80 |
| Position | Isocenter | Variable Flip Angle 02 | 39 |
| • | | /0/71 | |

| Variable Flip Angle 03 | 36 |
|------------------------|-----|
| Variable Flip Angle 04 | 34 |
| Variable Flip Angle 05 | 35 |
| Variable Flip Angle 06 | 36 |
| Variable Flip Angle 07 | 39 |
| Variable Flip Angle 08 | 42 |
| Variable Flip Angle 09 | 48 |
| Variable Flip Angle 10 | 54 |
| Variable Flip Angle 11 | 64 |
| Variable Flip Angle 12 | 76 |
| Variable Flip Angle 13 | 130 |
| Variable Flip Angle 14 | 180 |
| Crusher Gr | 0 |

 $\verb|\USER\Fe| in berglab| Suhyung GRASE_IV_CS_GRASE BP_grase_IV_CS_VFA_SL36_TE22| \\$

| TA: 0:00 PAT: Off | Voxel size: 0.8×0.8×0.8 mm | • | t: BP_grase_IV_CS_SH |
|---------------------------|----------------------------|-----------------------|----------------------|
| Properties | | Pause after meas. 20 | 0 s |
| Prio Recon | Off | Pause after meas. 21 | 0 s |
| Before measurement | Oli | Pause after meas. 22 | 0 s |
| After measurement | | Pause after meas. 23 | 0 s |
| Load to viewer | On | Pause after meas. 24 | 0 s |
| Inline movie | Off | Pause after meas. 25 | 0 s |
| | On | Pause after meas. 26 | 0 s |
| Auto store images | Off | Pause after meas. 27 | 0 s |
| Load to stamp segments | Off | Pause after meas. 28 | 0 s |
| Load images to graphic | Oii | Pause after meas. 29 | 0 s |
| segments | 0" | Pause after meas. 30 | 0 s |
| Auto open inline display | Off | Pause after meas. 31 | 0 s |
| Start measurement without | On | Pause after meas. 32 | 0 s |
| further preparation | 0" | Pause after meas. 33 | 0 s |
| Wait for user to start | Off | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas, 35 | 0 s |
| Routine | | Pause after meas, 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| | | Pause after meas. 41 | 0 s |
| Orientation | Transversal | Pause after meas. 42 | 0 s |
| Phase enc. dir. | R >> L | Pause after meas, 43 | |
| Rotation | 90 deg | | 0 s |
| Phase oversampling | 0 % | Pause after meas. 44 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas. 45 | 0 s |
| Slices per slab | 36 | Pause after meas. 46 | 0 s |
| FoV read | 96 mm | Pause after meas. 47 | 0 s |
| FoV phase | 30.0 % | Multiple series | Off |
| Slice thickness | 0.8 mm | Resolution | |
| TR | 1500 ms | Base resolution | 120 |
| TE | 22.44 ms | Phase resolution | 100 % |
| Averages | 1 | Slice resolution | 100 % |
| Concatenations | 1 | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | | |
| Contrast | | PAT mode | None |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | 0 | |
| Fat sat. mode | Strong | Geometry | |
| | | Series | Interleaved |
| Averaging mode | Long term | Sat. region 1 | |
| Reconstruction | Magnitude | Thickness | 26 mm |
| Measurements | 48 | Position | Isocenter |
| Pause after meas. 1 | 0 s | Orientation | Sagittal |
| Pause after meas. 2 | 0 s | Special sat. | None |
| Pause after meas. 3 | 0 s | | |
| Pause after meas. 4 | 0 s | Table position | Н |
| Pause after meas. 5 | 0 s | Table position | 0 mm |
| Pause after meas. 6 | 0 s | Inline Composing | Off |
| Pause after meas. 7 | 0 s | | |
| Pause after meas. 8 | 0 s | System | |
| Pause after meas. 9 | 0 s | T1 | On |
| Pause after meas. 10 | 0 s | M2 | On |
| Pause after meas. 11 | 0 s | B4 | On |
| Pause after meas. 12 | 0 s | M3 | On |
| Pause after meas. 13 | 0 s | V32 | Off |
| Pause after meas. 14 | 0 s | Positioning mode | DEE |
| Pause after meas. 15 | 0 s | Positioning mode | REF |
| Pause after meas. 16 | 0 s | MSMA | S-C-T |
| Pause after meas. 17 | 0 S | Sagittal | R >> L |
| Pause after meas. 18 | 0 S | Coronal | A >> P |
| Pause after meas. 19 | 0 S | Transversal | F >> H |
| i ause ailei illeas. 19 | | Save uncombined | Off |
| | 5 | 1/71 | |

| Coil Combine Mode AutoAlign Auto Coil Select Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ? Ref. amplitude 1H Adjustment Tolerance Adjust volume | Adaptive Combine Default Standard Off Off Off Off 0.000 V Auto |
|--|--|
| Position Orientation Rotation A >> P R >> L F >> H Physio | Isocenter Transversal 90.00 deg 96 mm 29 mm |
| 1st Signal/Mode | None |
| Composing | |
| Sequence Introduction Dimension Reordering Contrasts Bandwidth | Off 3D Centric 1 1126 Hz/Px |
| Turbo factor EPI factor RF pulse type Gradient mode | 36 12 Normal Fast |
| refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 Variable Flip Angle 02 Variable Flip Angle 03 Variable Flip Angle 04 Variable Flip Angle 05 Variable Flip Angle 06 Variable Flip Angle 07 Variable Flip Angle 07 Variable Flip Angle 08 Variable Flip Angle 10 Variable Flip Angle 10 Variable Flip Angle 11 Variable Flip Angle 12 Variable Flip Angle 13 Variable Flip Angle 14 Crusher Gr | sinc 2560 90 ON Off Single 0 14 2560 2560 12 8 80 39 36 34 35 36 39 42 48 54 64 76 130 180 0 |

 $\verb|\USER\Feinberg| lab| Suhyung \\| GRASE_IV_CS_GRASE \\| BP_grase_IV_CS_VFA_SL36_TE27| \\| CS_VFA_SL36_TE27| \\| CS_$

| TA: 0:00 PAT: Off | Voxel size: 0.8×0.8×0.8 mm | Rel. SNR: 1.00 USEF | R: BP_grase_IV_CS_SH |
|---|----------------------------|-----------------------|----------------------|
| Proportion | | Pause after meas. 20 | 0 s |
| roperties | 0" | Pause after meas. 21 | 0 s |
| Prio Recon | Off | Pause after meas. 22 | 0 s |
| Before measurement | | Pause after meas. 23 | 0 s |
| After measurement | 0.5 | Pause after meas. 24 | 0 s |
| Load to viewer | On O# | Pause after meas. 25 | 0 s |
| Inline movie | Off | Pause after meas. 26 | 0 s |
| Auto store images | On Off | Pause after meas. 27 | 0 s |
| Load to stamp segments | Off Off | Pause after meas. 28 | 0 s |
| Load images to graphic | Oii | Pause after meas. 29 | 0 s |
| segments | 0# | Pause after meas. 30 | 0 s |
| Auto open inline display | Off | Pause after meas. 31 | 0 s |
| Start measurement without | On | Pause after meas. 32 | 0 s |
| further preparation | 0# | Pause after meas. 33 | 0 s |
| Wait for user to start | Off | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas. 35 | 0 s |
| outine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| Orientation | Transversal | Pause after meas. 41 | 0 s |
| Phase enc. dir. | R >> L | Pause after meas. 42 | 0 s |
| Rotation | 90 deg | Pause after meas. 43 | 0 s |
| Phase oversampling | 0 % | Pause after meas. 44 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas. 45 | 0 s |
| Slices per slab | 36 | Pause after meas. 46 | 0 s |
| FoV read | 96 mm | Pause after meas. 47 | 0 s |
| | 30.0 % | Multiple series | Off |
| FoV phase | | Multiple series | Oli |
| Slice thickness | 0.8 mm | Resolution | |
| TR | 1500 ms | Base resolution | 120 |
| TE | 27.04 ms | Phase resolution | 100 % |
| Averages | 1 | Slice resolution | 100 % |
| Concatenations | 1 | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | PAT mode | None |
| Ontrast Magn, propagation | None | | |
| Magn. preparation | | | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | Geometry | |
| Fat sat. mode | Strong | Series | Interleaved |
| Averaging mode | Long term | | |
| Reconstruction | Magnitude | Sat. region 1 | |
| Measurements | 48 | Thickness | 26 mm |
| Pause after meas. 1 | 0 s | Position | Isocenter |
| Pause after meas. 2 | 0 s | Orientation | Sagittal |
| Pause after meas. 3 | 0 s | Special sat. | None |
| Pause after meas. 4 | 0 s | Table position | Н |
| Pause after meas. 5 | 0 s | Table position | 0 mm |
| Pause after meas. 6 | 0 s | Inline Composing | Off |
| Pause after meas. 7 | 0 s | I mine Composing | Oii |
| Pause after meas. 8 | 0 s | System | |
| Pause after meas. 9 | 0 s 0 s | T1 | On |
| Pause after meas. 10 | 0 S | M2 | On |
| Pause after meas. 10 | 0 S 0 S | B4 | On |
| | | M3 | On |
| Pause after meas. 12 | 0 s | V32 | Off |
| | 0 s 0 s | | |
| Pause after meas. 13 | 116 | Positioning mode | REF |
| Pause after meas. 14 | | _ | |
| Pause after meas. 14 Pause after meas. 15 | 0 s | MSMA | S - C - T |
| Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s | MSMA Sagittal | R >> L |
| Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 | 0 s 0 s 0 s | | |
| Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s | Sagittal | R >> L |

| Coil Combine Mode | Adaptive Combine |
|--|---|
| AutoAlign Auto Coil Select | Default |
| Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ? Ref. amplitude 1H Adjustment Tolerance Adjust volume Position Orientation | Standard Off Off Off Off 0.000 V Auto Isocenter Transversal |
| Rotation | 90.00 deg |
| A >> P R >> L | 96 mm 29 mm |
| F >> H | 29 mm |
| Physio | Nene |
| 1st Signal/Mode | None |
| Composing | |
| Sequence Introduction | Off |
| Dimension | 3D |
| Reordering Contrasts | Centric 1 |
| Bandwidth | 1126 Hz/Px |
| Turbo factor | 36 |
| EPI factor RF pulse type | 16 Normal |
| Gradient mode | Fast |
| refocussing type | sinc 2560 |
| flip angle excit phase encoding | 90 ON |
| Maxwell compensation | Off |
| ICE program | single |
| prepscans actual ETL | 0 14 |
| excite duration | 2560 |
| refoc duration | 2560 |
| excite BWTP refoc BWTP | 12 8 |
| Variable Flip Angle 01 | 80 |
| Variable Flip Angle 02 | 39 |
| Variable Flip Angle 03 | 36 |
| Variable Flip Angle 04 Variable Flip Angle 05 | 34 35 |
| Variable Flip Angle 06 | 36 |
| Variable Flip Angle 07 | 39 |
| Variable Flip Angle 08 Variable Flip Angle 09 | 42 48 |
| Variable Flip Angle 10 | 54 |
| Variable Flip Angle 11 | 64 |
| Variable Flip Angle 12 | 76 120 |
| Variable Flip Angle 13 Variable Flip Angle 14 | 130 180 |
| Crusher Gr | 0 |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_ep3D_bold_CAIPI_ICEoff_ChannelM2 TA: 4:50 PAT: 4 Voxel size: 0.9x0.9x0.9 mm Rel. SNR: 1.00 USER: BP_ep3D_bold_CAIPI_SH

| Properties | | Elliptical filter | Off |
|---|-----------------|--------------------------|------------------|
| Prio Recon | Off | - Hamming | Off |
| Before measurement | | Geometry | |
| After measurement | | Multi-slice mode | Interleaved |
| Load to viewer | On | Series | Interleaved |
| Inline movie | Off | Special sat. | None |
| Auto store images | On | | |
| Load to stamp segments | Off | Table position | Н |
| Load images to graphic | Off | Table position | 0 mm |
| segments | 0" | Inline Composing | Off |
| Auto open inline display | Off | System | |
| Start measurement without | On | T1 | Off |
| further preparation | Off | M2 | On |
| Wait for user to start Start measurements | | B4 | Off |
| Start measurements | single | M3 | Off |
| Routine | | V32 | Off |
| Slab group 1 | | | DEE |
| Slabs | 1 | Positioning mode | REF |
| Dist. factor | 50 % | MSMA Societal | S-C-T |
| Position | Isocenter | Sagittal Coronal | R >> L A >> P |
| Orientation | Transversal | Transversal | A >> P F >> H |
| Phase enc. dir. | A >> P | Save uncombined | Cff |
| Rotation | 0.00 deg | Coil Combine Mode | Sum of Squares |
| Phase oversampling | 0 % | AutoAlign | Sum of Squares |
| Slice oversampling | 0.0 % | Auto Coil Select | Default |
| Slices per slab | 80 | | |
| FoV read | 198 mm | Shim mode | Standard |
| FoV phase | 100.0 % | Adjust with body coil | Off |
| Slice thickness | 0.90 mm | Confirm freq. adjustment | Off |
| TR | 50 ms | Assume Silicone | Off |
| TE | 20 ms | ! Ref. amplitude 1H | 200.000 V |
| Averages | 1 | Adjustment Tolerance | Auto |
| Concatenations | 1 None | Adjust volume | |
| Filter Coil elements | M2 | Position | Isocenter |
| Con elements | IVIZ | Orientation | Transversal |
| Contrast | | Rotation | 0.00 deg |
| MTC | Off | - R >> L | 198 mm |
| Flip angle | 90 deg | A >> P | 198 mm |
| Fat suppr. | None | F >> H | 72 mm |
| Averaging mode | Long term | Physio | |
| Reconstruction | Magnitude | 1st Signal/Mode | None |
| Measurements | 92 | BOLD | |
| Delay in TR | 0 ms | Motion correction | O# |
| Multiple series | Off | Spatial filter | Off Off |
| • | 3 11 | Spatial filter | Oli |
| Resolution | 0.10 | Sequence | |
| Base resolution | 210 | Introduction | Off |
| Phase resolution | 100 % | Dimension | 3D |
| Slice resolution | 100 % | Reordering | Linear |
| Phase partial Fourier | 6/8 | Contrasts | 1 |
| Slice partial Fourier | 6/8 | Bandwidth | 1254 Hz/Px |
| Interpolation | Off | Free echo spacing | Off |
| PAT mode | GRAPPA | Echo spacing | 0.9 ms |
| Accel. factor PE | 4 | EPI factor | 210 |
| Ref. lines PE | 96 | RF pulse type | Normal |
| Accel. factor 3D | 1 | Gradient mode | Fast |
| Ref. lines 3D | 32 | Excitation | Slab-sel. |
| | 02 | | 5 .00 00 |
| Reference scan mode | Separate | RF spoiling | On |
| | Separate | RF spoiling | On |
| Distortion Corr. | Separate Off | use Ernst angle | Off |
| | Separate | | |

FFT scale 1.00

 $\begin{array}{lll} \text{z shim} & 0.00 \text{ mT/m*ms} \\ \text{RF duration} & 2560 \text{ us} \\ \text{RF BWTP} & 5.2 \\ \text{EFFECTIVE TR} & 3000 \text{ ms} \\ \text{PatPartitions} & 60 \\ \text{EPI phase correction} & \text{local} \\ \end{array}$

PAT refscan mode segm LIN->PAR

use CAIPIOnCAIPI shift kz0CAIPI shift ky1dummy prepscan time3 ssilent gap0.000 s

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_ep3D_bold_multiecho_new_SH_CAIPI_noICE TA: 0:29 PAT: 4 Voxel size: 0.9×0.9×0.9 mm Rel. SNR: 1.00 USER: BP_ep3D_bold_multiecho_SH

| Before measurement | Properties | 0.0 | Elliptical filter Hamming | Off Off |
|--|---------------------------|-----------|---------------------------|----------------|
| After measurement Load to viewer On Series Interleaved Internaved Internaved Off Series Interleaved Internaved Internaved Off Series Interleaved Internaved Off Series Interleaved Internaved Off Series Interleaved Internaved Inte | Prio Recon | Off | 1 | |
| Load to viewer On | | | | |
| Inline movie | | | | |
| Auto store images | | | Series | Interleaved |
| Auto Store images On Content of the content o | | | Special sat | None |
| Load images to graphic segments Ratio open inline display | | _ | | |
| Segments | | | | |
| Auto open inline display Off System T1 | | Off | | 0 mm |
| Start measurement without further preparation Wait for user to start Off M2 | | | Inline Composing | Off |
| Turther preparation | | Off | System | |
| Mail for user to start Single M2 | Start measurement without | On | | 0" |
| Note | further preparation | | | |
| None | Wait for user to start | Off | | _ |
| Solab group 1 Slabs Slab group 1 Slabs Slab group 1 Slabs Dist. factor 50 % Position Isocenter Sagittal R >> L Coronal A >> P Transversal | Start measurements | single | | |
| Slabs group 1 Slabs | Douting | | | _ |
| Slabs | | | _ V32 | Off |
| Dist. factor 50 % Sagittal R >> L | | | Positioning mode | REE |
| Desition | | | | |
| Position | | | _ | |
| Transversal | | | | |
| Rotation | | | | |
| Note | Phase enc. dir. | A >> P | | |
| Phase oversampling | Rotation | 0.00 deg | | |
| Slice oversampling 0.0 % Auto Coil Select Default | Phase oversampling | 0 % | | Sum of Squares |
| Slices per slab | | 0.0 % | | |
| FoV read | | | Auto Coil Select | Default |
| FoV phase 100.0 % Slice thickness 0.90 mm Confirm freq, adjustment Off | | | Chim mode | Standard |
| Slice thickness | | | | |
| TR 50 ms Assume Silicone Off TE 20 ms ! Ref. amplitude 1H 200.000 V Averages 1 Adjustment Tolerance Auto Concatenations 1 Adjustment Tolerance Auto Filter None Position Isocenter Coil elements M2 Orientation Transversal Contrast Rotation 0.00 deg MTC Off R> L 198 mm Filip angle 13 deg R > P 198 mm Fat suppr. None F >> H 72 mm Averaging mode Long term Tst Signal/Mode None Reconstruction Magnitude BOLD Ist Signal/Mode None Measurements 5 BOLD Delay in TR 0 ms Motion correction Off Multiple series Off Sequence Introduction Off Resolution 220 Introduction Off Phase resolution 100 % Reordering Lin | | | Adjust with body coil | _ |
| TE 20 ms ! Ref. amplitude 1H 200.000 V Averages 1 Adjustment Tolerance Auto Concatenations 1 Adjust volume Isocenter Filter None Position Isocenter Coil elements M2 Orientation Transversal Contrast Rotation 0.00 deg R MTC Off R >> L 198 mm Fat suppr. None A >> P 198 mm Fat suppr. None F >> H 72 mm Averaging mode Long term Physio Physio Reconstruction Magnitude Ist Signal/Mode None Measurements 5 BOLD Motion correction Off Multiple series Off Sequence Sequence Resolution 220 Introduction Off Phase resolution 100 % Reordering Linear Slice resolution 100 % Reordering Linear Phase partial Fourier < | | | | |
| Averages 1 Adjustment Tolerance Auto Concatenations 1 Adjust volume Position Isocenter Filter None Position Isocenter Coil elements M2 Orientation Transversal Contrast Rotation 0.00 deg MTC Off R >> L 198 mm Filip angle 13 deg A >> P 198 mm Fat suppr. None F >> H 72 mm Averaging mode Long term Physio None Averaging mode Long term BOLD None Reconstruction Magnitude None None Measurements 5 BOLD None BoLD Motion correction Off Spatial filter Off Off Resolution Sequence Sequence Base resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier < | | | | |
| Concatenations Filter None Coil elements M2 M2 Adjust volume Position Isocenter Orientation Transversal Rotation 0.00 deg R >> L 198 mm Filtp angle 13 deg Fat suppr. None Averaging mode Reconstruction Magnitude Measurements 5 Delay in TR 0 ms Multiple series Off Resolution Base resolution 100 % Slice resolution 100 % Slice resolution 100 % Phase partial Fourier 6/8 Slice partial Fourier 6/8 Slice partial Fourier 6/8 Interpolation Off PAT mode Accel. factor PE Ref. lines PE Adjust volume Position Position Isocenter Orientation Isocenter Position Physio Physio R >> H Physio 1st Signal/Mode None Physio Sequence Motion correction Off Spatial filter Off Sequence Introduction Off Dimension 3D Reordering Linear Contrasts 1 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off Echo spacing 0.9 ms EPI factor 220 RF pulse type Normal | | | | |
| Filter Coil elements M2 Position Isocenter Coil elements M2 Orientation Transversal Rotation 0.00 deg R S L 198 mm A S P 198 mm F S H 72 mm MTC Off A S P 198 mm F S H 72 mm Averaging mode Long term Physio S BOLD S Delay in TR 0 ms Multiple series Off S Patial filter Off S Sequence S S E S B S B S S S S S S S S S S S S S | | | | Auto |
| Coil elements M2 | | • | 1 - | |
| Contrast MTC Off Flip angle Fat suppr. Averaging mode Reconstruction Magnitude Measurements Delay in TR Multiple series Off Resolution Base resolution Slice resolution Slice partial Fourier Phase partial Fourier Slice partial Fourier Accel. factor PE Aff. lines PE Arsuppr. Off Resolution Rotation O,00 deg R >> L 198 mm F>> H 72 mm Physio Physio 1st Signal/Mode None BOLD Motion correction Off Spatial filter Off Sequence Introduction Off Dimension Sequence Introduction Off Pree echo spacing Off Free echo spacing Off Contrasts Accel. factor PE Aff. lines PE Accel. factor PE Accel. fa | 1 | | Position | Isocenter |
| MTC Off R >> L 198 mm Flip angle 13 deg F >> H 72 mm Fat suppr. None F >> H 72 mm Averaging mode Long term Physio Reconstruction Magnitude Ist Signal/Mode None Measurements 5 BOLD Motion correction Off Delay in TR 0 ms Motion correction Off Multiple series Off Spatial filter Off Resolution 220 Introduction Off Phase resolution 100 % Dimension 3D Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 | Coil elements | M2 | Orientation | Transversal |
| MTC Off R >> L 198 mm Flip angle 13 deg A >> P 198 mm Fat suppr. None F >> H 72 mm Averaging mode Long term Physio Reconstruction Magnitude Tst Signal/Mode None Measurements 5 BOLD Motion correction Off Delay in TR 0 ms Motion correction Off Multiple series Off Spatial filter Off Resolution Sequence Sequence Resolution 100 % Dimension 3D Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type | Contrast | | Rotation | 0.00 deg |
| Flip angle 13 deg Fat suppr. Averaging mode Long term Physio Reconstruction Magnitude 1st Signal/Mode None Measurements 5 BOLD Delay in TR 0 ms Motion correction Off Spatial filter Off Resolution Sequence Base resolution 100 % Sequence Base resolution 100 % Reordering Linear Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Accel. factor PE 4 Ref. lines PE 96 Averaging mode Long term Physio Physio None Physio Motion correction Off Spatial filter Off Motion correction Off Spatial filter Off Poff Sequence Sequence Introduction Off Dimension 3D Reordering Linear Contrasts 1 Bandwidth 1262 Hz/Px Free echo spacing Off Echo spacing Off Spatial Fourier 220 RF pulse type Normal | | Off | - R >> L | 198 mm |
| Fat suppr. None F >> H 72 mm Averaging mode Long term Physio Reconstruction Magnitude S BOLD Delay in TR O ms Motion correction Off Multiple series Off Spatial filter Off Resolution Sequence Base resolution 100 % Sequence Phase resolution 100 % Dimension 3D Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off PAT mode GRAPPA Echo spacing Off Ref. lines PE 96 Revonstruction Physio None Roll Signal/Mode None Motion correction Off Spatial filter Off Motion correction Off Spatial filter Off Poff Sequence Introduction Off Dimension 3D Reordering Linear Contrasts 1 Bandwidth 1262 Hz/Px Free echo spacing Off Echo spacing Off Echo spacing 0.9 ms EPI factor 220 RF pulse type Normal | | | A >> P | 198 mm |
| Averaging mode Reconstruction Magnitude Measurements Delay in TR Multiple series Off Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice | | • | F >> H | 72 mm |
| Reconstruction Magnitude Measurements 5 Delay in TR Multiple series Off Magnitude Resolution Base resolution Phase resolution Slice resolution Phase partial Fourier Slice Par | i at suppi. | | Dhysia | |
| Measurements 5 Delay in TR 0 ms Multiple series Off Spatial filter Off Resolution Sequence Base resolution 100 % Phase resolution 100 % Slice resolution 100 % Phase partial Fourier 6/8 Slice partial Fourier 6/8 Interpolation Off Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Ref. lines PE 96 Resolution Sequence Introduction Off Dimension 3D Reordering Linear Contrasts 1 Bandwidth 1262 Hz/Px Free echo spacing Off Echo spacing 0.9 ms EPI factor 220 RF pulse type Normal | Averaging mode | Long term | | N |
| Delay in TR 0 ms Motion correction Off Multiple series Off Spatial filter Off Resolution Sequence Base resolution 220 Introduction Off Phase resolution 100 % Dimension 3D Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | Reconstruction | Magnitude | 1st Signal/Mode | None |
| Delay in TR 0 ms 0ff Spatial filter Off Spatial Fourier Off S | Measurements | 5 | BOLD | |
| Multiple seriesOffResolutionSequenceBase resolution220IntroductionOffPhase resolution100 %Dimension3DSlice resolution100 %ReorderingLinearPhase partial Fourier6/8Contrasts1Slice partial Fourier6/8Bandwidth1262 Hz/PxInterpolationOffFree echo spacingOffPAT modeGRAPPAEcho spacing0.9 msAccel. factor PE4EPI factor220Ref. lines PE96RF pulse typeNormal | Delay in TR | 0 ms | Motion correction | Off |
| Resolution Base resolution 220 Phase resolution 100 % Slice resolution 100 % Phase partial Fourier 6/8 Slice partial Fourier 6/8 Introduction 3D Reordering Linear Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Accel. factor PE 4 Ref. lines PE 96 Ref pulse type Normal | Multiple series | Off | | |
| Base resolution 220 Phase resolution 100 % Slice resolution 100 % Phase partial Fourier 6/8 Slice partial Fourier 6/8 Introduction Off Contrasts 1 Slice partial Fourier 6/8 Interpolation Off PAT mode GRAPPA Accel. factor PE 4 Ref. lines PE 96 Introduction Off Dimension 3D Contrasts 1 Bandwidth 1262 Hz/Px Free echo spacing Off Echo spacing 0.9 ms EPI factor 220 RF pulse type Normal | Desclution | | 1 . | . |
| Phase resolution 100 % Dimension 3D Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | | 220 | - <u> </u> | |
| Slice resolution 100 % Reordering Linear Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | | | | |
| Phase partial Fourier 6/8 Contrasts 1 Slice partial Fourier 6/8 Bandwidth 1262 Hz/Px Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | | | | |
| Slice partial Fourier 6/8 Interpolation Off Bandwidth 1262 Hz/Px Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 Ref. lines PE 96 RF pulse type Normal | | | _ | Linear |
| Interpolation Off Free echo spacing Off PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | | | | 1 |
| PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | | | Bandwidth | 1262 Hz/Px |
| PAT mode GRAPPA Echo spacing 0.9 ms Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | Interpolation | Off | Free echo spacing | Off |
| Accel. factor PE 4 EPI factor 220 Ref. lines PE 96 RF pulse type Normal | PAT mode | GRAPPA | Echo spacing | 0.9 ms |
| Ref. lines PE 96 RF pulse type Normal | | | EDI factor | 200 |
| Normal Normal | | | | |
| Accellifactor 3D Gradient mode Fast | | | | |
| D (I' OD OO | | | Gradient mode | Fast |
| Ref. lines 3D 32 Excitation Slab-sel. | | | | |
| Reference scan mode Separate RF spoiling On | Reference scan mode | Separate | RF spoiling | On |
| Distortion Corr. Off use Ernst angle Off | Distortion Corr | Off | use Ernet angle | Off |
| Distortion Corr. Off use Ernst angle Off Prescan Normalize Off Maxwell Correction Off | | | | |
| Raw filter On log physio files Off | | | | |
| log priysio liles Oil | 1 | | log buyan mea | OII |

FFT scale 1.00

 $\begin{array}{lll} \text{z shim} & 0.00 \text{ mT/m*ms} \\ \text{RF duration} & 2560 \text{ us} \\ \text{RF BWTP} & 5.2 \\ \text{EFFECTIVE TR} & 3000 \text{ ms} \\ \text{PatPartitions} & 60 \\ \text{EPI phase correction} & \text{local} \\ \end{array}$

PAT refscan mode segm LIN->PAR

use CAIPIOnCAIPI shift kz0CAIPI shift ky1dummy prepscan time3 ssilent gap0.000 s

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_clean_VASO_V10t_noClip
TA: 0:30 PAT: Off Voxel size: 0.8×0.8×1.5 mm Rel. SNR: 1.00 USER: BP_grase_clean_VASO_V10_noClip

| Properties | | Prescan Normalize | Off |
|--|--------------------|--------------------------|-------------------|
| Prio Recon | Off | Raw filter | Off |
| Before measurement | | Geometry | |
| After measurement | | Series | Interleaved |
| Load to viewer | On | | |
| Inline movie | Off | Sat. region 1 | |
| Auto store images | On O" | Thickness | 26 mm |
| Load to stamp segments | Off | Position | R1.4 P6.6 H0.7 |
| Load images to graphic | Off | Orientation | C > S25.3 > T6.2 |
| segments | 0# | Special sat. | None |
| Auto open inline display | Off On | Table position | Н |
| Start measurement without | On | Table position | 0 mm |
| further preparation Wait for user to start | Off | Inline Composing | Off |
| Start measurements | single | 1 | |
| Start measurements | Sirigie | System | |
| Routine | | T1 | On |
| Slab group 1 | | — M2 | On On |
| Slabs | 1 | B4 | On On |
| Dist. factor | 0 % | M3 V32 | On Off |
| Position | R43.2 A10.6 H23.0 | V 3∠ | OII |
| Orientation | T > S31.6 > C-3.3 | Positioning mode | FIX |
| Phase enc. dir. | A >> P | MSMA | S - C - T |
| Rotation | -20.00 deg | Sagittal | R >> L |
| Phase oversampling | 0 % | Coronal | A >> P |
| Slice oversampling | 0.0 % | Transversal | F >> H |
| Slices per slab | 8 | Save uncombined | Off |
| FoV read | 99 mm | Coil Combine Mode | Adaptive Combine |
| FoV phase | 25.8 % | AutoAlign | |
| Slice thickness | 1.5 mm | Auto Coil Select | Default |
| TR | 3000 ms | Shim mode | Standard |
| TE | 45.9 ms | Adjust with body coil | Off |
| Averages Concatenations | 1 1 | Confirm freq. adjustment | Off |
| Filter | • | Assume Silicone | Off |
| Coil elements | None B4;M2,3;T1 | ! Ref. amplitude 1H | 220.000 V |
| Con elements | D4,IVI2,3,1 1 | Adjustment Tolerance | Auto |
| Contrast | | Adjust volume | |
| Magn. preparation | Non-sel. IR | Position | R43.2 A10.6 H23.0 |
| TI | 1100 ms | Orientation | T > S31.6 > C-3.3 |
| Flip angle | 165 deg | Rotation | -20.00 deg |
| Fat suppr. | Fat sat. | R >> L | 99 mm |
| Fat sat. mode | Strong | A >> P | 26 mm |
| Averaging mode | Long term | F >> H | 12 mm |
| Reconstruction | Magnitude | Physio | |
| Measurements | 10 | 1st Signal/Mode | None |
| Pause after meas. 1 | 0.0 s | 1st Signal/Mode | None |
| Pause after meas. 2 | 0.0 s | Composing | <u> </u> |
| Pause after meas. 3 | 0.0 s | Sequence | |
| Pause after meas. 4 | 0.0 s | Introduction | Off |
| Pause after meas. 5 | 0.0 s | Dimension | 3D |
| Pause after meas. 6 | 0.0 s | Reordering | Centric |
| Pause after meas. 7 | 0.0 s | Contrasts | 2 |
| Pause after meas. 8 | 0.0 s | Bandwidth | 1052 Hz/Px |
| Pause after meas. 9 | 0.0 s | Echo spacing | 1.1 ms |
| Multiple series | Off | | |
| Resolution | | Turbo factor | 5 |
| Base resolution | 132 | _ EPI factor | 34 |
| | 100 % | RF pulse type | Normal |
| Phase resolution Slice resolution | 100 % | Gradient mode | Fast |
| Slice partial Fourier | 5/8 | BIR4: 2nd segm phase | 338 |
| Interpolation | Off | BIR4: duration | 5120 |
| | ····· | excite duration | 2560 |
| PAT mode | None | 1 | |

| 2560 |
|--------|
| 10.4 |
| 5.2 |
| ON |
| Off |
| single |
| |

| \\USE | R∖Feinber | glab\Suhyung\GRASE_IV_C | S_GRASE\VASC |)_116_phantom | |
|----------|-----------|----------------------------|----------------|----------------|--|
| TA: 0:30 | PAT: 2 | Voxel size: 0.7×0.7×1.5 mm | Rel. SNR: 1.00 | USER: VASO_116 | |

| Properties | | PAT mode | GRAPPA |
|---------------------------|--------------------|--------------------------------|--------------------|
| Prio Recon | Off | Accel. factor PE | 2 |
| Before measurement | | Ref. lines PE | 36 |
| After measurement | | Accel. factor 3D | 1 |
| Load to viewer | On | Ref. lines 3D | 8 |
| Inline movie | Off | Reference scan mode | Separate |
| Auto store images | On | Prescan Normalize | Off |
| Load to stamp segments | Off | Raw filter | Off |
| Load images to graphic | Off | Elliptical filter | Off |
| segments | Oli | Hamming | Off |
| | Off | Паппппу | Oli |
| Auto open inline display | Off | Geometry | |
| Start measurement without | On | Multi-slice mode | Interleaved |
| further preparation | | Series | Ascending |
| Wait for user to start | Off | | |
| Start measurements | single | Special sat. | Parallel F |
| Routine | | Gap | 25.0 mm |
| | | Thickness | 100 mm |
| Slab group 1 | _ | | |
| Slabs | 1 | Table position | Н |
| Dist. factor | 50 % | Table position | 0 mm |
| Position | R37.8 A6.9 H16.3 | Inline Composing | Off |
| Orientation | T > S25.8 > C-11.1 | System | |
| Phase enc. dir. | R >> L | System | |
| Rotation | 70.00 deg | T1 | On |
| Phase oversampling | 0 % | M2 | On |
| Slice oversampling | 0.0 % | B4 | On |
| Slices per slab | 8 | M3 | On |
| FoV read | 32.8 mm | V32 | Off |
| | | | |
| FoV phase | 300.0 % | Positioning mode | FIX |
| Slice thickness | 1.50 mm | MSMA | S - C - T |
| TR | 1500.00 ms | Sagittal | R >> L |
| TE | 24 ms | Coronal | A >> P |
| Averages | 1 | Transversal | F >> H |
| Concatenations | 1 | Save uncombined | Off |
| Filter | None | Coil Combine Mode | Sum of Squares |
| Coil elements | B4;M2,3;T1 | AutoAlign | |
| • | | Auto Coil Select | Default |
| Contrast | | | |
| Perfusion mode | Picore Q2TIPS | Shim mode | Standard |
| TI2 | 900 ms | Adjust with body coil | Off |
| TI1 | 50 ms | Confirm freq. adjustment | Off |
| TI1s | 50 ms | Assume Silicone | Off |
| Flip angle | 26 deg | ! Ref. amplitude 1H | 230.000 V |
| Fat suppr. | Fat sat. | Adjustment Tolerance | Auto |
| Fat sat. mode | Strong | = | Auto |
| | | Adjust volume | D27 0 AC 0 H4C 2 |
| Averaging mode | Long term | Position | R37.8 A6.9 H16.3 |
| Reconstruction | Magn./Phase | Orientation | T > S25.8 > C-11.1 |
| Measurements | 20 | Rotation | 160.00 deg |
| Delay in TR | 0 ms | R >> L | 99 mm |
| Multiple series | Off | A >> P | 33 mm |
| | | F >> H | 12 mm |
| Perfusion mode | PICORE Q2T | Dhysis | |
| Inversion time 1 | 50 ms | Physio | |
| Saturation stop time | 50 ms | 1st Signal/Mode | None |
| Inversion time 2 | 900.0 ms | BOLD | |
| Flow limit | 100.0 cm/s | | Off |
| | 100.0 011/0 | Motion correction | Off |
| Resolution | | Spatial filter | Off |
| Base resolution | 44 | Sequence | |
| Phase resolution | 100 % | Introduction | On |
| Slice resolution | 100 % | | 3D |
| Phase partial Fourier | 6/8 | Dimension | |
| Slice partial Fourier | | Reordering | Linear |
| SIICE DALIAL FOULEE | Off | Contrasts | 1 |
| | O# | | |
| Interpolation | Off | Bandwidth Free echo spacing | 1062 Hz/Px Off |

| Echo spacing | 1.07 ms |
|--|--|
| EPI factor RF pulse type Gradient mode Excitation RF spoiling | 132 Normal Normal Slab-sel. On |
| Ampl BWDTH ph.skip 4 Robert (the one) use Ernst angle Maxwell Correction log physio files FFT scale dummy prepscan time z shim RF duration RF BWTP Renzo: Delta TI EFFECTIVE TR PatPartitions EPI phase correction PAT refscan mode FlashRef BaseRes FlashRef BW FlashRef FA use CAIPI | 120 150 3.1kHz 30 Off Off Off Off 1.00 3 s 0.00 mT/m*ms 2560 us 25.0 71 ms 12000 ms 8 local Flash 44 136 Hz/px 5000 us 5 deg Off |

 $\verb|\USER\Fe| in berglab \Suhyung \GRASE_IV_CS_GRASE \BP_grase_IV_CS_VFA_SL36_ETL14_TE22_TR12| \\$ TA: 0:00 Voxel size: 0.8×0.8×0.8 mm Rel. SNR: 1.00 USER: BP_grase_IV_CS_SH

| Properties | | Pause after meas. 20 | 0 s |
|--|---|--|--|
| Prio Recon | Off | — Pause after meas. 21 | 0 s |
| Before measurement | Oil | Pause after meas. 22 | 0 s |
| After measurement | | Pause after meas. 23 | 0 s |
| Load to viewer | On | Pause after meas. 24 | 0 s |
| Inline movie | Off | Pause after meas. 25 | 0 s |
| Auto store images | On | Pause after meas. 26 | 0 s |
| | Off | Pause after meas. 27 | 0 s |
| Load to stamp segments | Off | Pause after meas. 28 | 0 s |
| Load images to graphic | Oil | Pause after meas. 29 | 0 s |
| segments | Off | Pause after meas. 30 | 0 s |
| Auto open inline display | On | Pause after meas. 31 | 0 s |
| Start measurement without | On | Pause after meas. 32 | 0 s |
| further preparation | Off | Pause after meas. 33 | 0 s |
| Wait for user to start | | Pause after meas. 34 | 0 s |
| Start measurements | single | Pause after meas. 35 | 0 s |
| Routine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas, 40 | 0 s |
| Orientation | Transversal | Pause after meas. 41 | 0 s |
| Phase enc. dir. | A >> P | Pause after meas, 42 | 0 s |
| Rotation | 0 deg | Pause after meas. 43 | 0 s |
| Phase oversampling | 0 % | Pause after meas. 44 | 0 s |
| | 0.0 % | Pause after meas. 45 | 0 s |
| Slice oversampling | *** /* | Pause after meas. 46 | 0 s |
| Slices per slab | 36 | Pause after meas, 47 | 0 s |
| FoV read | 90 mm | | Off |
| FoV phase | 25.0 % | Multiple series | Oli |
| Slice thickness | 0.8 mm | Resolution | |
| TR | 1200 ms | Base resolution | 112 |
| TE . | 22.82 ms | Phase resolution | 100 % |
| Averages | 1 | Slice resolution | 100 % |
| Concatenations | 1 | Slice partial Fourier | Off |
| Filter | None | Interpolation | Off |
| Coil elements | B4;M2,3;T1 | | |
| Contrast | | PAT mode | None |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | | - |
| Fat sat. mode | Strong | Geometry | |
| | | Series | Interleaved |
| Averaging mode | Long term | Sat. region 1 | |
| Reconstruction | Magnitude | Thickness | 20 mm |
| Measurements | 48 | Position | Isocenter |
| Pause after meas. 1 | 0 s | Orientation | Coronal |
| Pause after meas. 2 | 0 s | | |
| Davisa ofter mass 2 | 0 s | Special sat. | None |
| Pause after meas. 3 | 0 0 | | |
| Pause after meas. 4 | 0 s | Table position | Н |
| | | Table position Table position | H 0 mm |
| Pause after meas. 4 Pause after meas. 5 | 0 s 0 s | Table position | 0 mm |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 | 0 s 0 s 0 s | | |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 | 0 s 0 s 0 s 0 s | Table position Inline Composing System | 0 mm Off |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 | 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 | 0 mm Off On |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 | 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System | 0 mm Off |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 | 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 | 0 mm Off On |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 | 0 mm Off On On |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 | 0 mm Off On On On |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 | 0 mm Off On On On On Off |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode | 0 mm Off On On On On Off |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode MSMA | 0 mm Off On On On On Off REF S - C - T |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode MSMA Sagittal | 0 mm Off On On On On Off REF S - C - T R >> L |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode MSMA Sagittal Coronal | O mm Off On On On On Off REF S - C - T R >> L A >> P |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 Pause after meas. 18 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode MSMA Sagittal Coronal Transversal | 0 mm Off On On On On Off REF S - C - T R >> L A >> P F >> H |
| Pause after meas. 4 Pause after meas. 5 Pause after meas. 6 Pause after meas. 7 Pause after meas. 8 Pause after meas. 9 Pause after meas. 10 Pause after meas. 11 Pause after meas. 12 Pause after meas. 13 Pause after meas. 14 Pause after meas. 15 Pause after meas. 16 Pause after meas. 17 | 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s 0 s | Table position Inline Composing System T1 M2 B4 M3 V32 Positioning mode MSMA Sagittal Coronal | O mm Off On On On On Off REF S - C - T R >> L A >> P |

| Coil Combine Mode AutoAlign | Adaptive Combine |
|--|--|
| Auto Coil Select | Default |
| Shim mode Adjust with body coil Confirm freq. adjustment Assume Silicone ! Ref. amplitude 1H Adjustment Tolerance Adjust volume | Standard Off Off Off 220.000 V Auto |
| Position | Isocenter |
| Orientation Rotation R >> L A >> P F >> H | Transversal 0.00 deg 90 mm 23 mm 29 mm |
| Physio 1st Signal/Mode | None |
| Composing | THO II O |
| Sequence | |
| Introduction Dimension Reordering Contrasts Bandwidth | Off 3D Centric 1 1144 Hz/Px |
| Turbo factor EPI factor RF pulse type Gradient mode | 36 12 Normal Fast |
| refocussing type flip angle excit phase encoding Maxwell compensation ICE program prepscans actual ETL excite duration refoc duration excite BWTP refoc BWTP Variable Flip Angle 01 Variable Flip Angle 02 Variable Flip Angle 03 Variable Flip Angle 05 Variable Flip Angle 05 Variable Flip Angle 06 Variable Flip Angle 07 Variable Flip Angle 08 Variable Flip Angle 09 Variable Flip Angle 10 Variable Flip Angle 11 Variable Flip Angle 11 Variable Flip Angle 12 Variable Flip Angle 13 Variable Flip Angle 14 Crusher Gr | sinc 2560 90 ON Off single 0 12 2560 2560 14 8 64 35 32 31 33 35 39 45 50 62 78 128 72 122 0 |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_grase_IV_CS_VFA_SL36_ETL14_TE22_TR20
TA: 0:00 PAT: Off Voxel size: 0.8×0.8×0.8 mm Rel. SNR: 1.00 USER: BP_grase_IV_CS_SH

| Properties | | Pause after meas. 20 | 0 s |
|---|-------------|---|-------------|
| Prio Recon | Off | Pause after meas. 21 | 0 s |
| Before measurement | | Pause after meas. 22 | 0 s |
| After measurement | | Pause after meas. 23 Pause after meas. 24 | 0 s |
| Load to viewer | On | | 0 s |
| Inline movie | Off | Pause after meas. 25 | 0 s |
| Auto store images | On | Pause after meas. 26 | 0 s |
| Load to stamp segments | Off | Pause after meas. 27 | 0 s |
| Load images to graphic | Off | Pause after meas. 28 | 0 s |
| segments | . | Pause after meas. 29 | 0 s |
| Auto open inline display | Off | Pause after meas. 30 | 0 s |
| Start measurement without | On | Pause after meas. 31 | 0 s |
| further preparation | OII | Pause after meas. 32 | 0 s |
| Wait for user to start | Off | Pause after meas. 33 | 0 s |
| Start measurements | single | Pause after meas. 34 | 0 s |
| Otan measurements | Single | Pause after meas. 35 | 0 s |
| Routine | | Pause after meas. 36 | 0 s |
| Slab group 1 | | Pause after meas. 37 | 0 s |
| Slabs | 1 | Pause after meas. 38 | 0 s |
| Dist. factor | 0 % | Pause after meas. 39 | 0 s |
| Position | Isocenter | Pause after meas. 40 | 0 s |
| Orientation | Transversal | Pause after meas. 41 | 0 s |
| Phase enc. dir. | A >> P | Pause after meas. 42 | 0 s |
| Rotation | 0 deg | Pause after meas. 43 | 0 s |
| Phase oversampling | 0 % | Pause after meas, 44 | 0 s |
| Slice oversampling | 0.0 % | Pause after meas, 45 | 0 s |
| Slices per slab | 36 | Pause after meas, 46 | 0 s |
| FoV read | 90 mm | Pause after meas. 47 | 0 s |
| FoV phase | 25.0 % | Multiple series | Off |
| Slice thickness | 0.8 mm | · | 3 11 |
| TR | 2000 ms | Resolution | |
| TE | 22.82 ms | Base resolution | 112 |
| | | Phase resolution | 100 % |
| Averages Concatenations | 1 1 | Slice resolution | 100 % |
| | • | Slice partial Fourier | Off |
| Filter Coil elements | None | Interpolation | Off |
| | B4;M2,3;T1 | PAT mode | None |
| Contrast | None | Dragger Normaliza | O# |
| Magn. preparation | None | Prescan Normalize | Off |
| Flip angle | 180 deg | Raw filter | Off |
| Fat suppr. | Fat sat. | Geometry | |
| Fat sat. mode | Strong | Series | Interleaved |
| Averaging mode | Long term | Cat ragion 1 | |
| Reconstruction | Magnitude | Sat. region 1 | 00 |
| Measurements | 48 | Thickness | 20 mm |
| Pause after meas. 1 | 0 s | Position | Isocenter |
| Pause after meas. 2 | 0 s | Orientation | Coronal |
| Pause after meas. 3 | 0 s | Special sat. | None |
| Pause after meas. 4 | 0 s | Table position | Н |
| Pause after meas. 5 | 0 s | Table position | 0 mm |
| Pause after meas. 6 | 0 s | Inline Composing | Off |
| Pause after meas. 7 | 0 s | Timile Composing | 3 11 |
| Pause after meas. 8 | 0 s | System | |
| Pause after meas. 9 | 0 s | T1 | On |
| Pause after meas. 10 | 0 s | M2 | On |
| Pause after meas. 11 | 0 s | B4 | On |
| Pause after meas. 12 | 0 s | M3 | On |
| Pause after meas. 12 | 0 s | V32 | Off |
| Pause after meas. 13 Pause after meas. 14 | | | |
| | 0 s | Positioning mode | REF |
| Pause after meas. 15 | 0 s | MSMA | S - C - T |
| Pause after meas. 16 | 0 s | Sagittal | R >> L |
| Pause after meas. 17 | 0 s | Coronal | A >> P |
| Pause after meas. 18 | 0 s | Transversal | F >> H |
| Pause after meas. 19 | 0 s | Save uncombined | Off |
| | | 65/71 | |

| Coil Combine Mode | Adaptive Combine |
|--|--------------------------|
| AutoAlign | D () |
| Auto Coil Select | Default |
| Shim mode | Standard |
| Adjust with body coil | Off |
| Confirm freq. adjustment | Off |
| Assume Silicone | Off |
| ! Ref. amplitude 1H | 220.000 V |
| Adjustment Tolerance | Auto |
| Adjust volume Position | laggenter |
| Orientation | Isocenter Transversal |
| Rotation | 0.00 deg |
| R >> L | 90 mm |
| A >> P | 23 mm |
| F >> H | 29 mm |
| Dhusia | |
| Physio 1st Signal/Mode | None |
| | Notie |
| Composing | |
| Sequence | |
| Introduction | Off |
| Dimension | 3D |
| Reordering | Centric |
| Contrasts | 1 |
| Bandwidth | 1144 Hz/Px |
| Turbo factor | 36 |
| EPI factor | 12 |
| RF pulse type | Normal |
| Gradient mode | Fast |
| refocussing type | sinc 2560 |
| flip angle excit | 90 |
| phase encoding | ON |
| Maxwell compensation | Off |
| ICE program | single |
| prepscans | 0 |
| actual ETL | 12 |
| excite duration | 2560 |
| refoc duration | 2560 |
| excite BWTP refoc BWTP | 14 8 |
| Variable Flip Angle 01 | 64 |
| Variable Flip Angle 01 Variable Flip Angle 02 | 35 |
| Variable Flip Angle 02 Variable Flip Angle 03 | 32 |
| Variable Flip Angle 04 | 31 |
| Variable Flip Angle 05 | 33 |
| Variable Flip Angle 06 | 35 |
| Variable Flip Angle 07 | 39 |
| Variable Flip Angle 08 | 45 |
| Variable Flip Angle 09 | 50 |
| Variable Flip Angle 10 | 62 |
| Variable Flip Angle 11 | 78 |
| Variable Flip Angle 12 | 128 |
| Variable Flip Angle 13 | 72 |
| Variable Flip Angle 14 | 122 |
| Crusher Gr | 0 |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\GE_p8mm_MB1IPAT3_pf6_te23_tr1505_sat_PIFrSn_3 TA: 0:29 PAT: 3 Voxel size: 1.0×1.0×0.8 mm Rel. SNR: 1.00 USER: AV_ep2d_bold_sd_20140727

| Properties | | Sat. region 1 Thickness | 50 mm |
|---------------------------|-----------------|---------------------------|-------------------|
| Prio Recon | Off | Position | L10.9 A51.7 F73.1 |
| Before measurement | | Orientation | T > C-33.5 > S4.0 |
| After measurement | | Special sat. | None |
| Load to viewer | On | Special Sat. | |
| Inline movie | Off | Table position | Н |
| Auto store images | On | Table position | 0 mm |
| Load to stamp segments | Off | Inline Composing | Off |
| Load images to graphic | Off | | 3 |
| segments | Oli | System | |
| Auto open inline display | Off | T1 | On |
| | | M2 | On |
| Start measurement without | On | B4 | On |
| further preparation | 2" | M3 | On |
| Wait for user to start | Off | V32 | Off |
| Start measurements | single | | |
| Routine | | Positioning mode | FIX |
| Slice group 1 | | — MSMA | S - C - T |
| Slices | 21 | Sagittal | R >> L |
| Dist. factor | 0% | Coronal | A >> P |
| Position | L2.1 A10.0 F9.9 | Transversal | F >> H |
| Orientation | T > C29.9 | Coil Combine Mode | Sum of Squares |
| | | AutoAlign | |
| Phase enc. dir. | A >> P | Auto Coil Select | Default |
| Rotation | 0.00 deg | | |
| Phase oversampling | 0 % | Shim mode | Standard |
| FoV read | 215 mm | Adjust with body coil | Off |
| FoV phase | 77.7 % | Confirm freq. adjustment | On |
| Slice thickness | 0.80 mm | Assume Silicone | Off |
| TR | 3000 ms | ! Ref. amplitude 1H | 230.000 V |
| TE | 23.4 ms | Adjustment Tolerance | Auto |
| Multi-band accel. factor | 1 | Adjust volume | 71010 |
| Filter | None | Position | L2.1 A10.0 F9.9 |
| Coil elements | B4;M2,3;T1 | Orientation | T > C29.9 |
| Con elements | D+,IVI2,3,1 1 | | |
| Contrast | | Rotation | 0.00 deg |
| MTC | Off | — R >> L | 215 mm |
| Magn. preparation | None | A >> P | 168 mm |
| Flip angle | 60 deg | F >> H | 17 mm |
| Fat suppr. | Fat sat. | Physio | |
| | | 1st Signal/Mode | None |
| Averaging mode | Long term | - | 110110 |
| Reconstruction | Magnitude | BOLD | |
| Measurements | 5 | GLM Statistics | Off |
| Delay in TR | 0 ms | Dynamic t-maps | Off |
| Multiple series | Off | Starting ignore meas | 0 |
| · | | Ignore after transition | 0 |
| Resolution | | — Model transition states | On |
| Base resolution | 224 | Temp. highpass filter | On |
| Phase resolution | 100 % | Threshold | 4.00 |
| Phase partial Fourier | 6/8 | | |
| Interpolation | Off | Paradigm size | 12 |
| | 00,400,4 | Meas[1] | Baseline |
| PAT mode | GRAPPA | Meas[2] | Baseline |
| Accel. factor PE | 3 | Meas[3] | Baseline |
| Ref. lines PE | 48 | Meas[4] | Baseline |
| Reference scan mode | GRE | Meas[5] | Baseline |
| Distortion Com- | O# | Meas[6] | Baseline |
| Distortion Corr. | Off | Meas[7] | Baseline |
| Prescan Normalize | Off | Meas[8] | Baseline |
| Raw filter | On | Meas[9] | Baseline |
| Elliptical filter | Off | Meas[10] | Baseline |
| Hamming | Off | | |
| • | | Meas[11] | Active |
| Geometry | | Meas[12] | Active |
| Multi-slice mode | Interleaved | Motion correction | Off |
| Series | Interleaved | Spatial filter | Off |

Sequence

| Coquentos | |
|--|--------------|
| Introduction | Off |
| Bandwidth | 1174 Hz/Px |
| Flow comp. | No |
| Free echo spacing | Off |
| Echo spacing | 1 ms |
| SIR accel. factor | 1 |
| EPI factor | 174 |
| Gradient mode | Normal |
| RF spoiling | Off |
| | 2040 |
| Excite pulse duration Slice multiplier | 3640 us 1 |
| Fake MB factor for SB | 1 |
| No. of interleaved TEs | 0 |
| RF pulse shape | 1 |
| EPI noise scans | 0 |
| EPI full reference scan | 0 |
| SENSE1 coil combine | Off |
| Log physiology to file | Off |
| Invert RO/PE polarity | Off |
| Save reduced raw data | Off |
| Readout slice trace | Off |
| Disable ramp sampling | Off |
| PF omits higher k-space | Off |
| FFT scale factor | 0.10 |
| GRE iPAT ref. FA | 12.0 deg |
| Send B1 shim trigger | Never |
| Triggering scheme | Standard |
| Starting ignore meas | 0 |
| Paradigm size | 2 |
| Multiplier | 1 |
| Step [1] | 1 |
| Step [2] | 0 |
| ı | |

\\USER\Feinberglab\Suhyung\GRASE_IV_CS_GRASE\BP_ep3D_bold_multiecho_new_SH_noCAIPI TA: 0:35 PAT: 4 Voxel size: 1.0×1.0×0.9 mm Rel. SNR: 1.00 USER: BP_ep3D_bold_multiecho_SH

| Properties | | Elliptical filter Hamming | Off Off |
|---------------------------------|-------------------|-------------------------------------|----------------|
| Prio Recon | Off | ı | J |
| Before measurement | | Geometry | |
| After measurement | | Multi-slice mode | Interleaved |
| Load to viewer | On | Series | Interleaved |
| Inline movie | Off | Chariel ant | Nama |
| Auto store images | On | Special sat. | None |
| Load to stamp segments | Off | Table position | Н |
| Load images to graphic | Off | Table position | 0 mm |
| segments | | Inline Composing | Off |
| Auto open inline display | Off | | 5 |
| Start measurement without | On | System | |
| further preparation | 3 | T1 | On |
| Wait for user to start | Off | M2 | On |
| Start measurements | single | B4 | On |
| Start measurements | Single | M3 | On |
| Routine | | V32 | Off |
| Slab group 1 | | | |
| Slabs | 1 | Positioning mode | REF |
| Dist. factor | 50 % | MSMA | S - C - T |
| Position | Isocenter | Sagittal | R >> L |
| Orientation | Transversal | Coronal | A >> P |
| Phase enc. dir. | A >> P | Transversal | F >> H |
| | | Save uncombined | Off |
| Rotation | 0.00 deg | Coil Combine Mode | Sum of Squares |
| Phase oversampling | 0 % | AutoAlign | |
| Slice oversampling | 0.0 % | Auto Coil Select | Default |
| Slices per slab | 104 | | |
| FoV read | 215 mm | Shim mode | Standard |
| FoV phase | 100.0 % | Adjust with body coil | Off |
| Slice thickness | 0.90 mm | Confirm freq. adjustment | Off |
| TR | 52 ms | Assume Silicone | Off |
| TE | 20 ms | ! Ref. amplitude 1H | 200.000 V |
| Averages | 1 | Adjustment Tolerance | Auto |
| Concatenations | 1 | Adjust volume | Auto |
| Filter | None | Position | Isocenter |
| Coil elements | B4;M2,3;T1 | Orientation | Transversal |
| | _ ·,···_,o, · · | | |
| Contrast | | Rotation | 0.00 deg |
| MTC | Off | R >> L | 215 mm |
| Flip angle | 13 deg | A >> P | 215 mm |
| Fat suppr. | None | F >> H | 94 mm |
| | | Physio | |
| Averaging mode | Long term | 1st Signal/Mode | None |
| Reconstruction | Magnitude | 1 | None |
| Measurements | 5 | BOLD | |
| Delay in TR | 0 ms | Motion correction | Off |
| Multiple series | Off | Spatial filter | Off |
| Resolution | | 1 . | |
| | 220 | Sequence | |
| Base resolution | 220 | Introduction | Off |
| Phase resolution | 100 % | Dimension | 3D |
| Slice resolution | 100 % | Reordering | Linear |
| Phase partial Fourier | 6/8 | Contrasts | 1 |
| Slice partial Fourier | 6/8 | Bandwidth | 1136 Hz/Px |
| Interpolation | Off | Free echo spacing | Off |
| DAT mode | CDADDA | Echo spacing | 0.98 ms |
| PAT mode | GRAPPA | | |
| Accel. factor PE | 4 | EPI factor | 220 |
| Ref. lines PE | 96 | RF pulse type | Normal |
| Accel. factor 3D | 1 | Gradient mode | Fast |
| Ref. lines 3D | 32 | Excitation | Slab-sel. |
| Reference scan mode | Separate | RF spoiling | On |
| Distortion Corr. | Off | | |
| | | use Ernst angle | Off |
| Drecean Normaliza | () †† | | |
| Prescan Normalize Raw filter | Off On | Maxwell Correction log physio files | Off Off |

FFT scale 1.00

 $\begin{array}{lll} \text{z shim} & 0.00 \text{ mT/m*ms} \\ \text{RF duration} & 2560 \text{ us} \\ \text{RF BWTP} & 5.2 \\ \text{EFFECTIVE TR} & 4056 \text{ ms} \\ \text{PatPartitions} & 78 \\ \text{EPI phase correction} & \text{local} \\ \end{array}$

PAT refscan mode segm LIN->PAR

use CAIPI Off dummy prepscan time 3 s silent gap 0.000 s

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\\USER

```
Feinberglab
       Suhyung
               GRASE_IV_CS_GRASE
                      localizer_200V_nova
                      t1_mpr_sag_p9mm_iso
                      b1map_200V_TR1000_nova
                      mp2rage_0.8mmiso_TR4500
                      ----- For STE vs nSTE
                      BP_grase_IV_Regular
                      BP_grase_IV_Regular_nSTE
                      BP_grase_IV_Regular
                      BP_grase_IV_Regular_nSTE
                      BP_grase_IV_Regular_nSTE_T2map_ICEoff
                      se_mc
                      ----- For Point Spread Functions -----
                      BP_grase_IV_Regular
                      BP_grase_IV_VFA
                      BP_grase_IV_CS_CFA_SL18_ETL06
                      BP_grase_IV_CS_VFA_SL24_ETL10
                      BP_grase_IV_CS_VFA_SL36_ETL14
                      ----- For Visual Cortex ------
                      BP_grase_IV_Regular
                      BP_grase_IV_VFA
                      BP_grase_IV_CS_CFA_SL18_ETL06
                      BP_grase_IV_CS_VFA_SL24_ETL10
                      BP_grase_IV_CS_VFA_SL36_ETL14
                      BP_grase_IV_CS_VFA_SL48_ETL14
                      -----For Motor Cortex ------
                      BP_grase_IV_Regular
                      BP_grase_IV_VFA
                      BP_grase_IV_CS_CFA_SL18_ETL06
                      BP_grase_IV_CS_VFA_SL24_ETL10
                      BP_grase_IV_CS_VFA_SL36_ETL14
                      ----- For STG -----
                      BP_grase_IV_CS_VFA_SL36_TE22
                      BP_grase_IV_CS_VFA_SL36_TE27
                      For 3D EPI
                      BP_ep3D_bold_CAIPI_ICEoff_ChannelM2
                      BP_ep3D_bold_multiecho_new_SH_CAIPI_noICE
                      - For Motor Cortex: turn off phase encode
                      -----Point Spread Function for Alex- turn off phase encode
                      BP_grase_clean_VASO_V10t_noClip
                      VASO_116_phantom
                      Enhance Tissue Contrast For Sam
                      BP_grase_IV_CS_VFA_SL36_ETL14_TE22_TR12
                      BP_grase_IV_CS_VFA_SL36_ETL14_TE22_TR20
                      -----3DEPI CAIPI: turn on phase encode, ice off for last
                      GE_p8mm_MB1IPAT3_pf6_te23_tr1505_sat_PIFrSn_391i
                      BP_ep3D_bold_multiecho_new_SH_noCAIPI
```