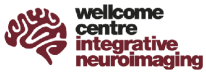


Single subject QC report generated using eddy quad v1.0.2

When using eddy and its QC tools, we ask you to please reference the papers describing the different aspects of the modelling and corrections. The following suggestion for a methods section and list of references has been tailored for you based on your eddy command line.

METHODS
The susceptibility induced off-resonance field was estimated from spin-echo EPI images acquired with different phase-encode directions (Andersson et al., 2003). This field was passed to "eddy", a tool that combined it with estimating gross subject movement and eddy current-induced distortions (Andersson & Sotiropoulos, 2016).The quality of the dataset was assessed using the eddy QC tools (Bastiani et al., 2019). Slices with signal loss caused by subject movement coinciding with the diffusion encoding were detected and replaced by predictions made by a Gaussian Process (Andersson et al., 2016). Intra-volume subject movement, leading to disjoint slices that when stacked does not amount to a valid volumetric representation of the object, was corrected using slice-to-volume alignment (Andersson et al., 2017). Changes to the susceptibility-induced distortions caused by subject movement was estimated directly from the data using a Taylor expansion, with respect to pitch and roll, around the first volume of the data set (Andersson et al., 2018).

REFERENCES
Jesper L.R. Andersson, Stefan Skare and John Ashburner. 2003. How to correct susceptibility distortions in spin-echo echo-planar images: application to diffusion tensor imaging. NeuroImage 20:870-888

Jesper L.R. Andersson and Stamatios N. Sotiropoulos. 2016. An integrated approach to correction for off-resonance effects and subject movement in diffusion MR imaging. NeuroImage 125:1063-1078

Matteo Bastiani, Michiel Cottaar, Sean P. Fitzgibbon, Sana Suri, Fidel Alfaro-Almagro, Stamatios N. Sotiropoulos, Saad Jbabdi and Jesper L.R. Andersson. 2019. Automated quality control for within and between studies diffusion MRI data using a non-parametric framework for movement and distortion correction. NeuroImage 184:801-812

Jesper L.R. Andersson, Mark S. Graham, Eniko Zsoldos and Stamatios N. Sotiropoulos. 2016. Incorporating outlier detection and replacement into a non-parametric framework for movement and distortion correction of diffusion MR images. NeuroImage 141:556-572

Jesper L.R. Andersson, Mark S. Graham, Ivana Drobnjak, Hui Zhang, Nicola Filippini and Matteo Bastiani. 2017. Towards a comprehensive framework for movement and distortion correction of diffusion MR images: Within volume movement. NeuroImage 152:450-466

Jesper L.R. Andersson, Mark S. Graham, Ivana Drobnjak, Hui Zhang and Jon Campbell. 2018. Susceptibility-induced distortion that varies due to motion: Correction in diffusion MR without acquiring additional data. NeuroImage 171:277-295

Subject /vol/dhcp-results/neodmri_2nd_release_rerun/CC00117XX10/ses-38200/PreProcessed/eddy/eddy_corrected.nii.gz

Volume-to-volume motion

.	Average abs. motion (mm)	2.34
.	Average rel. motion (mm)	2.59
.	Average x translation (mm)	-1.05
.	Average y translation (mm)	-0.19
.	Average z translation (mm)	-0.67
.	Average x rotation (deg)	0.08
.	Average y rotation (deg)	0.98
.	Average z rotation (deg)	-1.11

Within-volume motion

.	Avg std x translation (mm)	0.10
.	Avg std y translation (mm)	0.09
.	Avg std z translation (mm)	0.22
.	Avg std x rotation (deg)	0.55
.	Avg std y rotation (deg)	0.44
.	Avg std z rotation (deg)	0.38

Outliers

.	Total outliers (%)	6.34
.	Outliers (b=400 s/mm^2)	10.50
.	Outliers (b=1000 s/mm^2)	6.85
.	Outliers (b=2600 s/mm^2)	3.92
.	Outliers (PE dir=[0. 1. 0.])	6.17
.	Outliers (PE dir=[0. -1. 0.])	4.65
.	Outliers (PE dir=[1. 0. 0.])	9.25
.	Outliers (PE dir=[-1. 0. 0.])	3.62

SNR/CNR

.	Average SNR (b=0 s/mm^2)	9.38
.	Average CNR (b=400 s/mm^2)	0.44
.	Average CNR (b=1000 s/mm^2)	0.73
.	Average CNR (b=2600 s/mm^2)	0.70

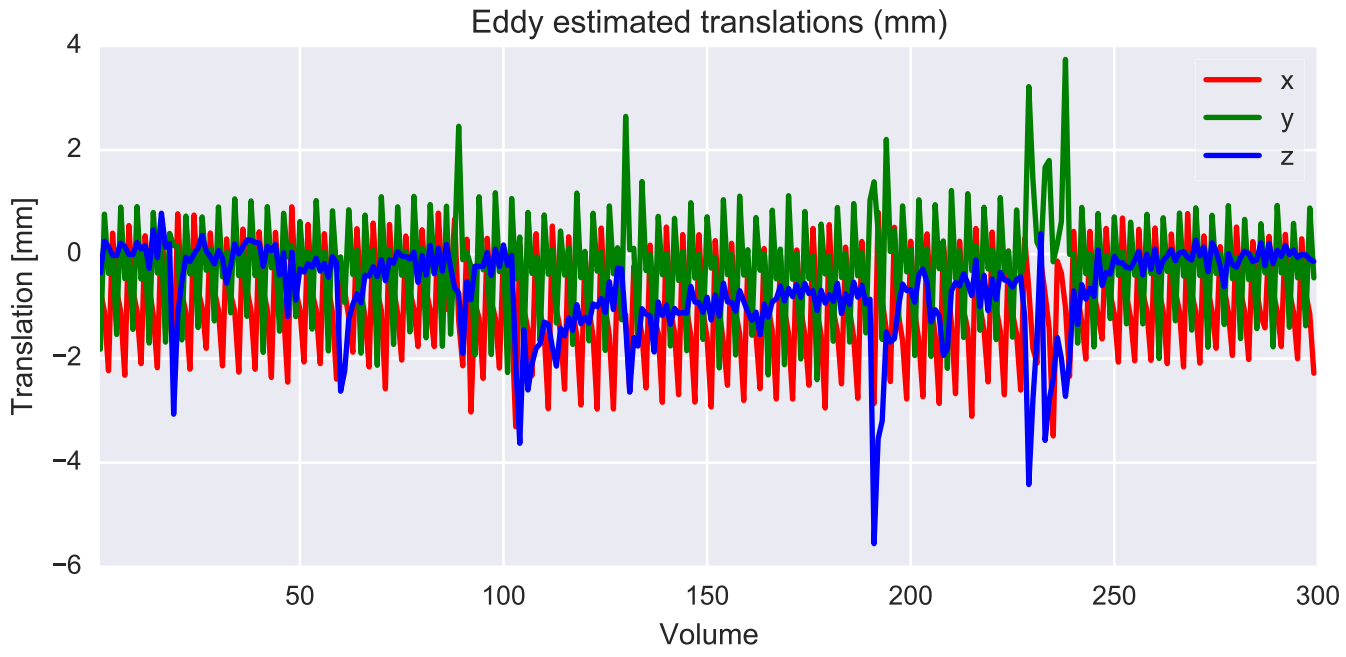
Eddy currents

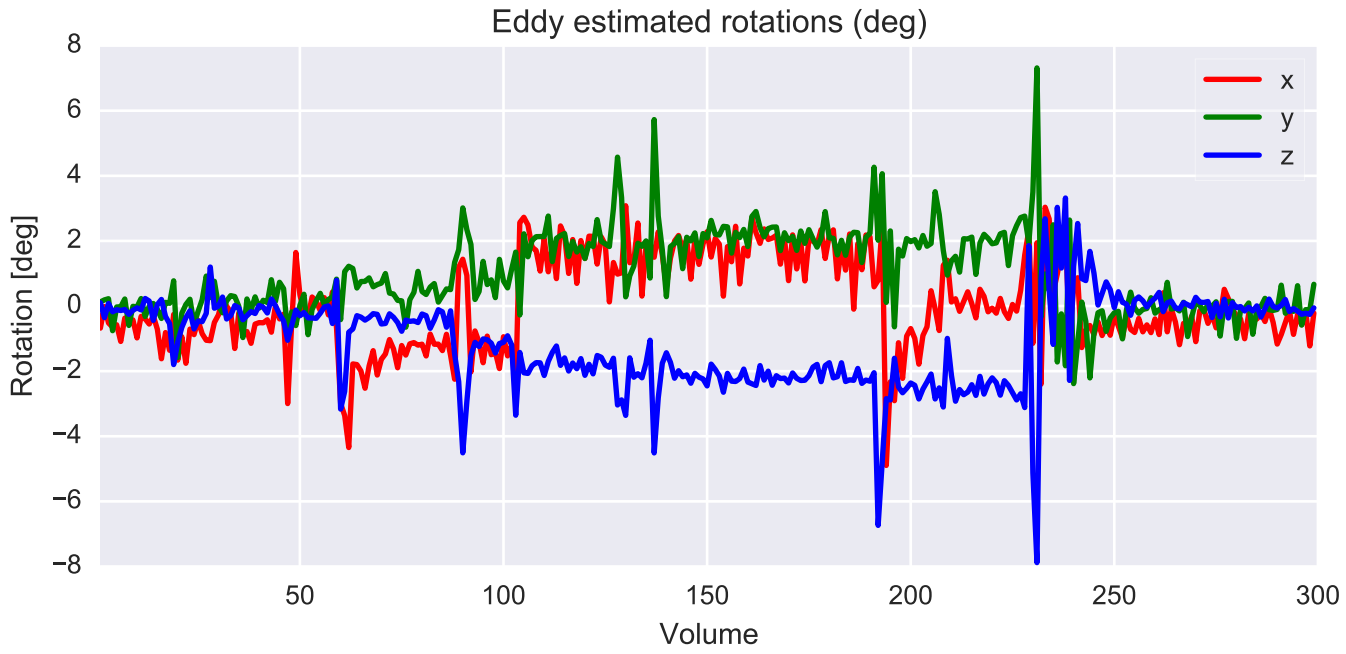
.	Std Dev EC linear term (x)	0.10
.	Std Dev EC linear term (y)	0.14
.	Std Dev EC linear term (z)	0.13

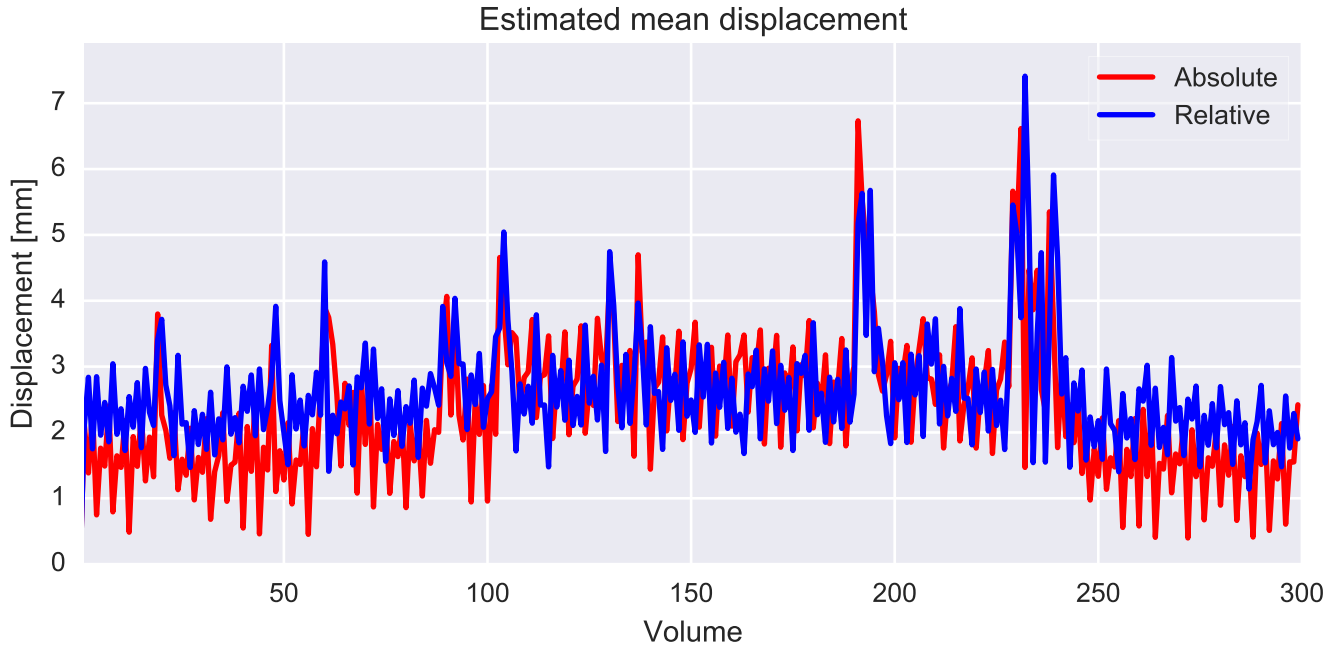
Susceptibility distortions

.	Std Dev voxel displacement	1.43

Subject /vol/dhcp-results/neodmri_2nd_release_rerun/CC00117XX10/ses-38200/PreProcessed/eddy/eddy_corrected.nii.gz







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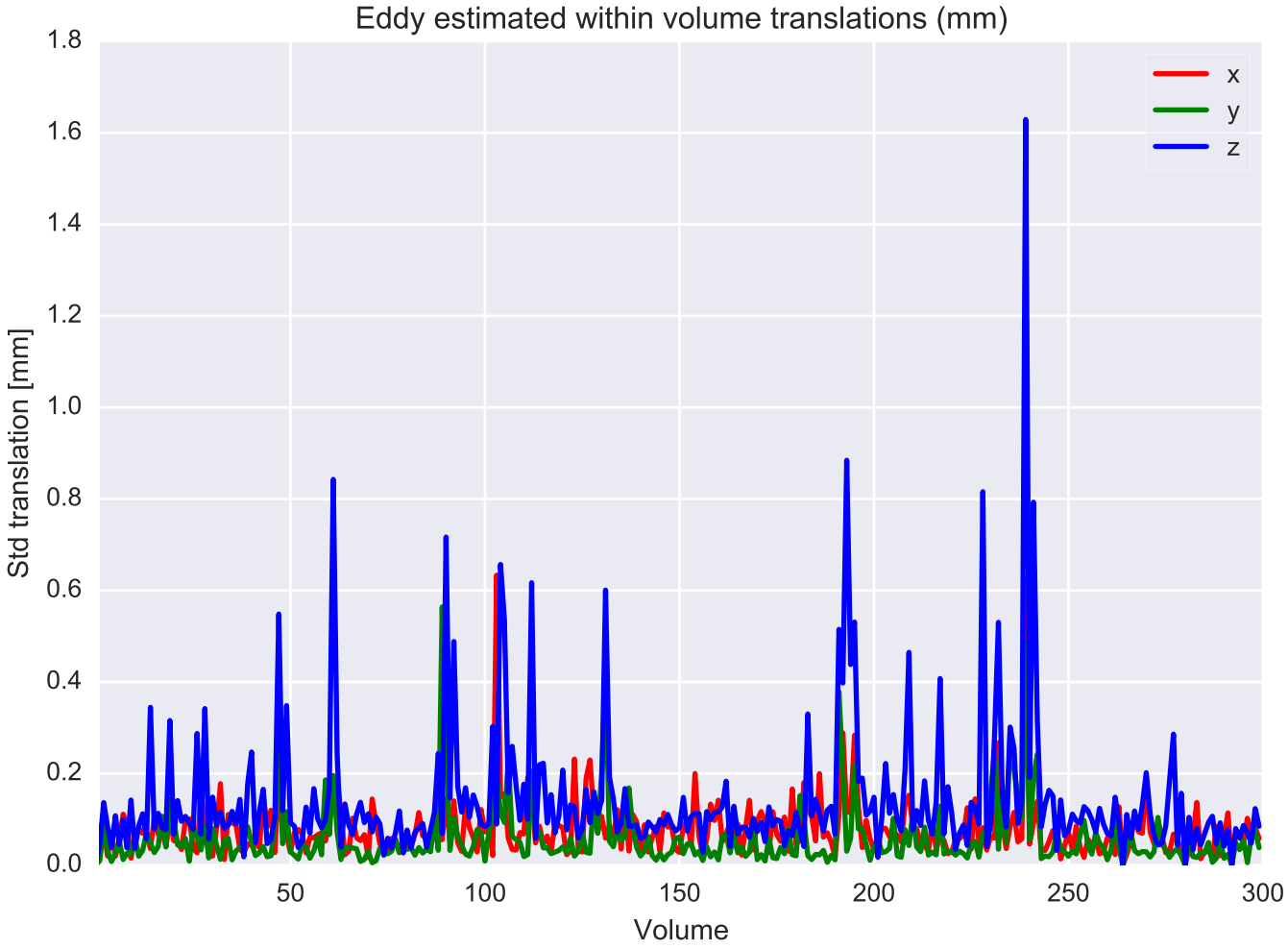

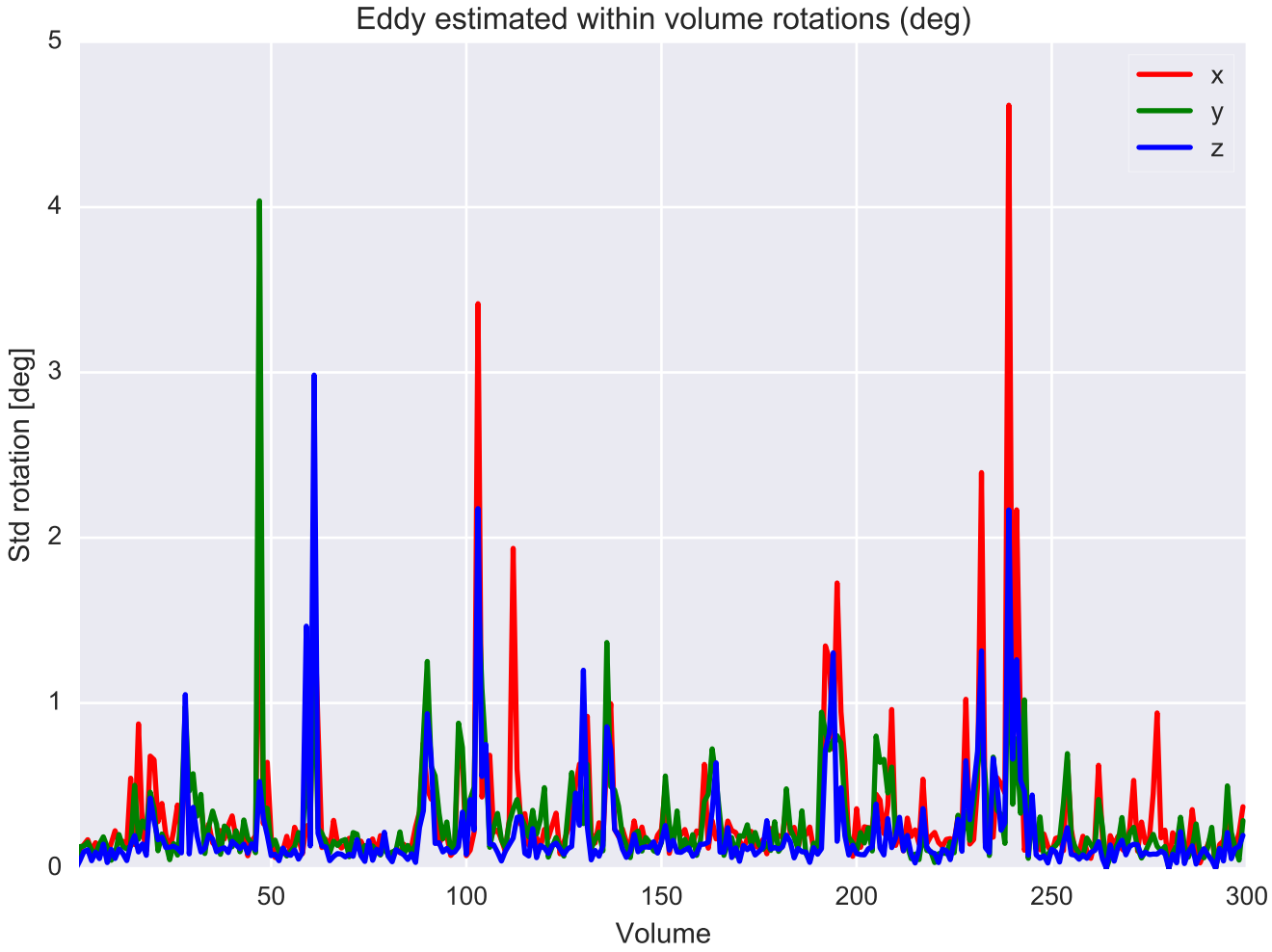

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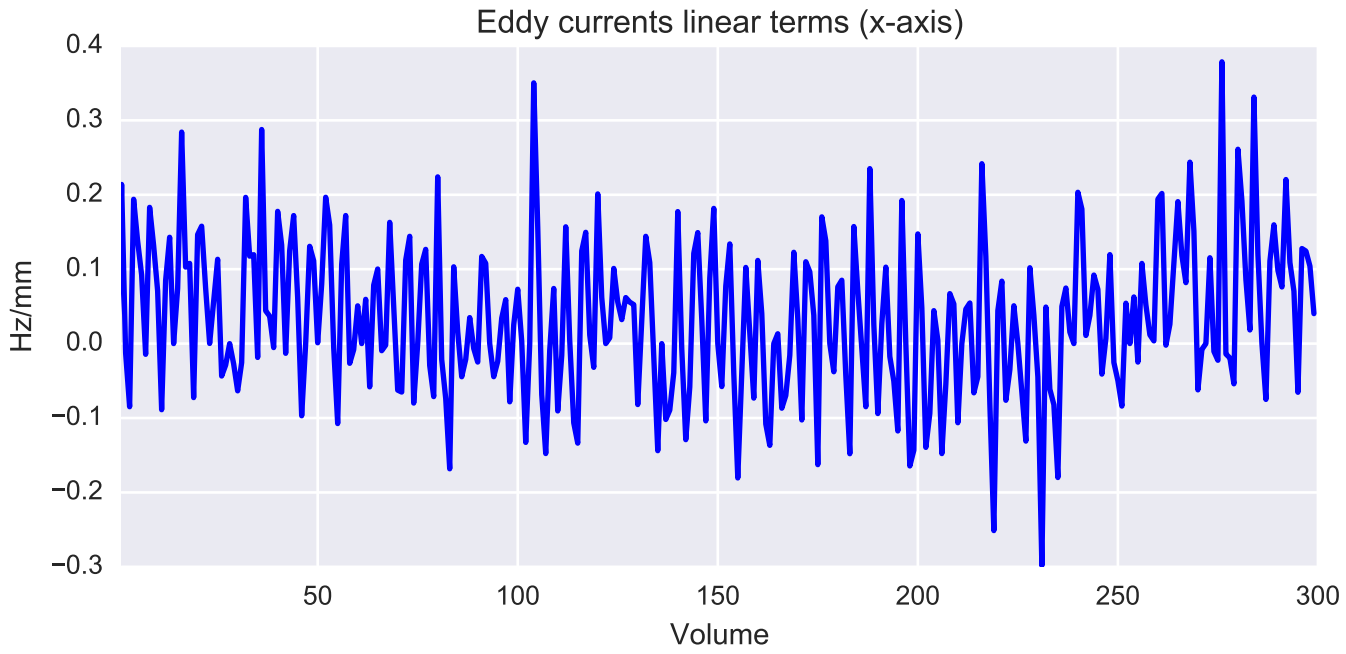
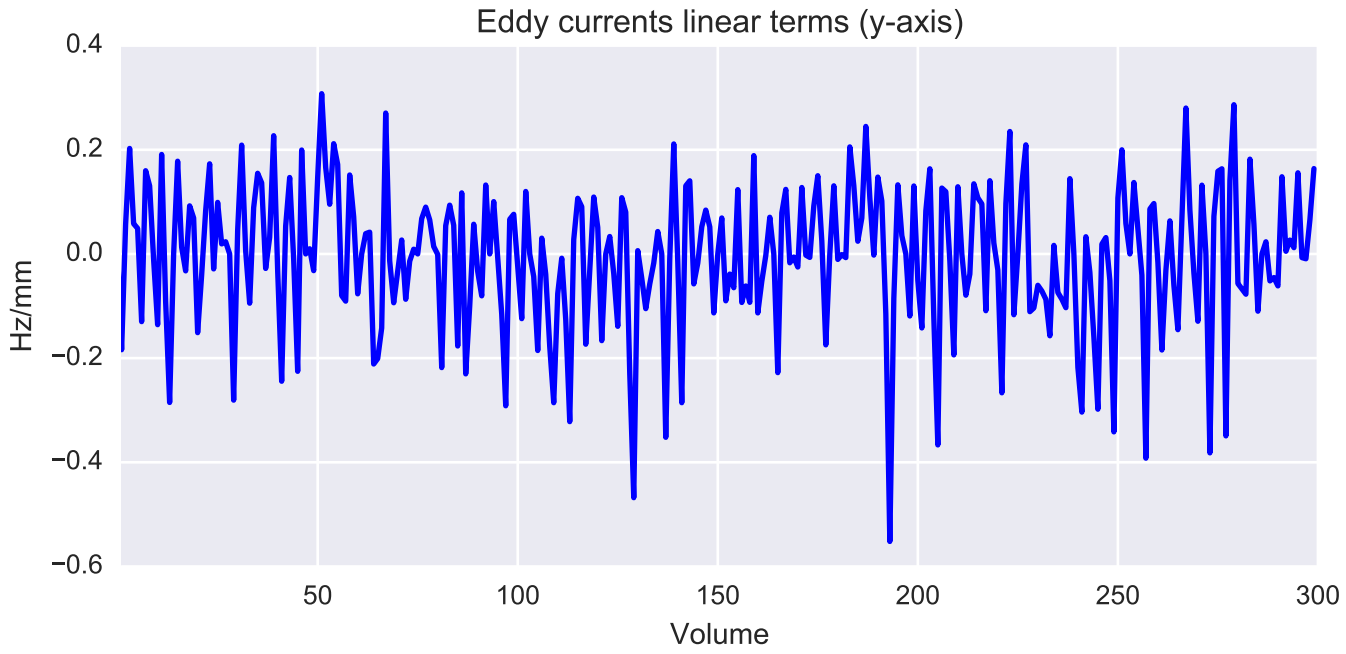
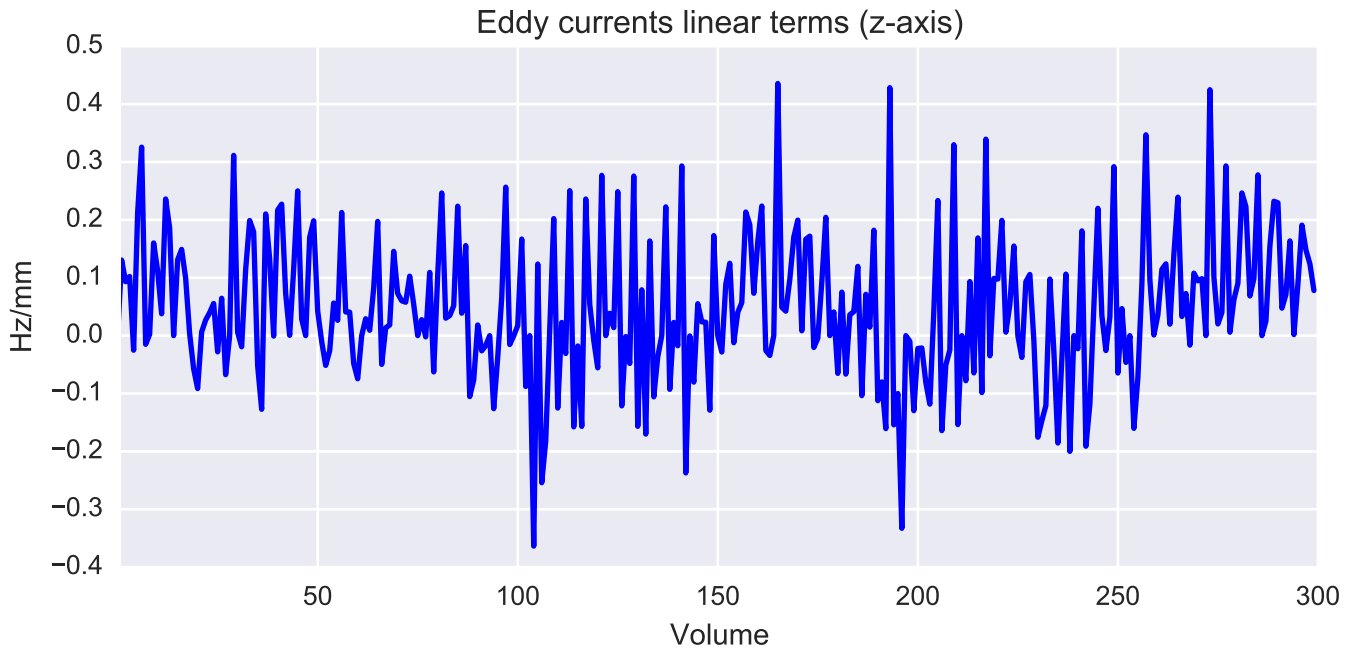
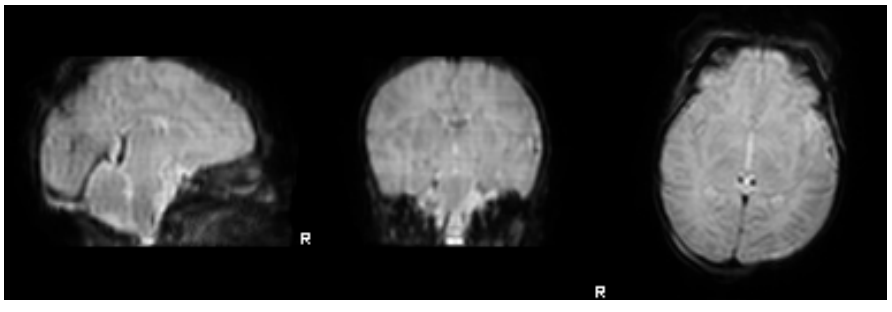






Subject /vol/dhcp-results/neodmri_2nd_release_rerun/CC00117XX10/ses-38200/PreProcessed/eddy/eddy_corrected.nii.gz

Average b0 signal (PE=[[0. 1. 0.]])



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48
42
36
30
24
18
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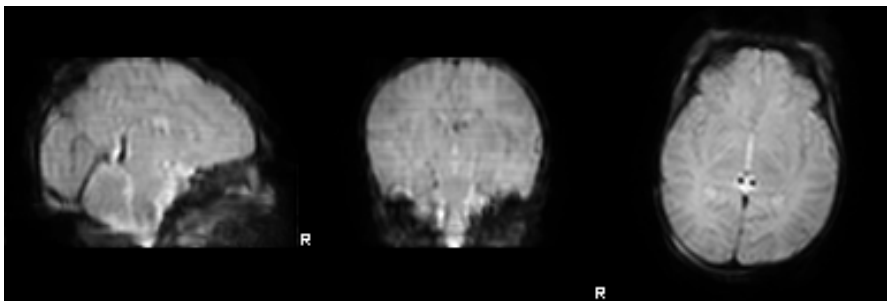

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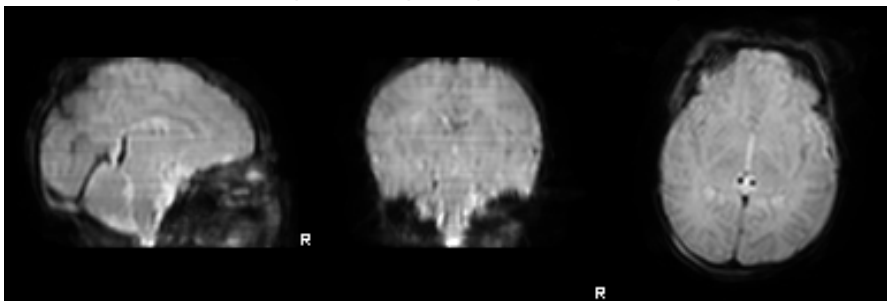

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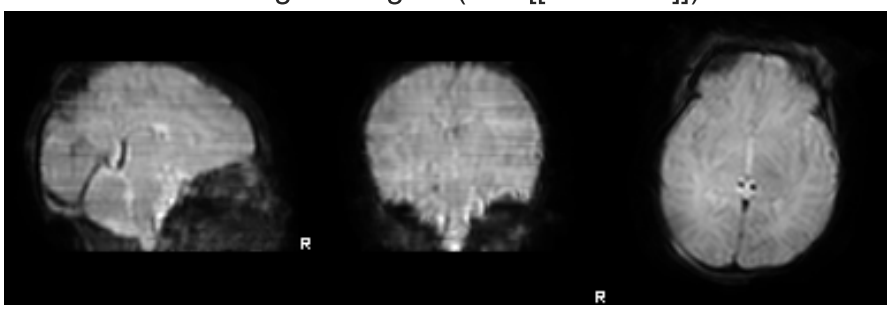

54
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42
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30
24
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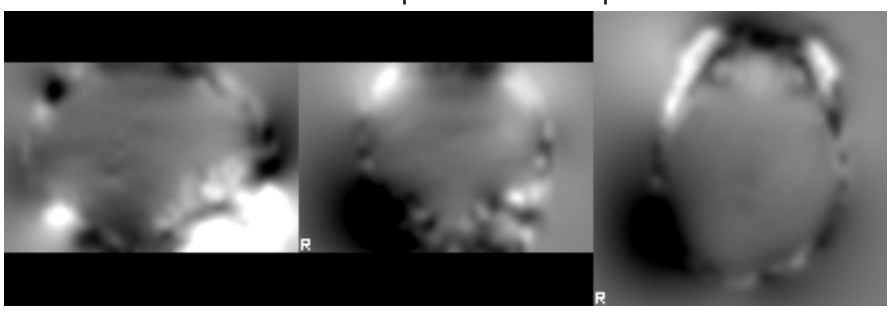
6
0

Voxel displacement map



4.0
3.2
2.4
1.6
0.8
0.0
−0.8
−1.6
−2.4
−3.2
−4.0

Subject /vol/dhcp-results/neodmri_2nd_release_rerun/CC00117XX10/ses-38200/PreProcessed/eddy/eddy_corrected.nii.gz

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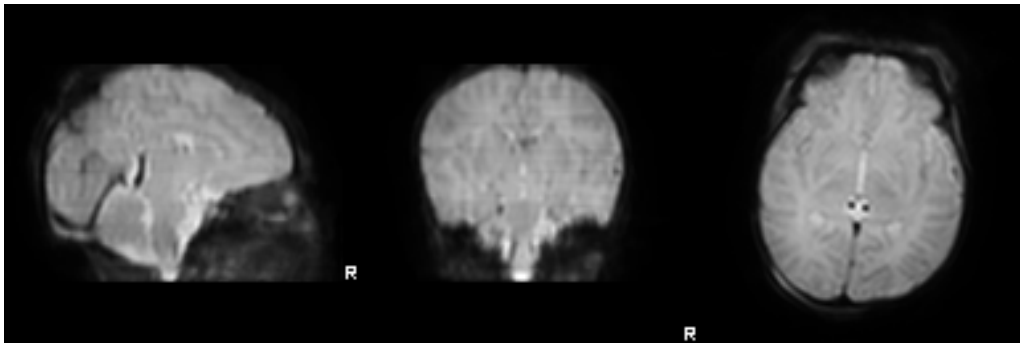

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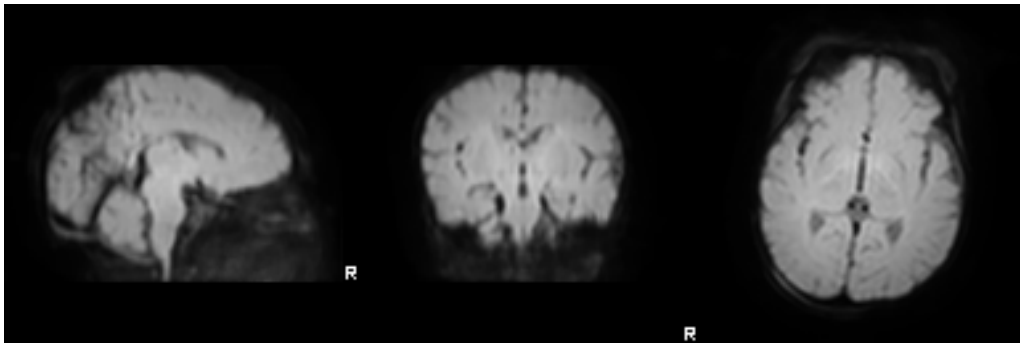

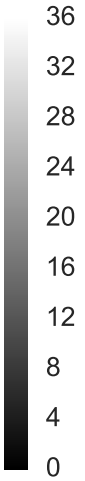

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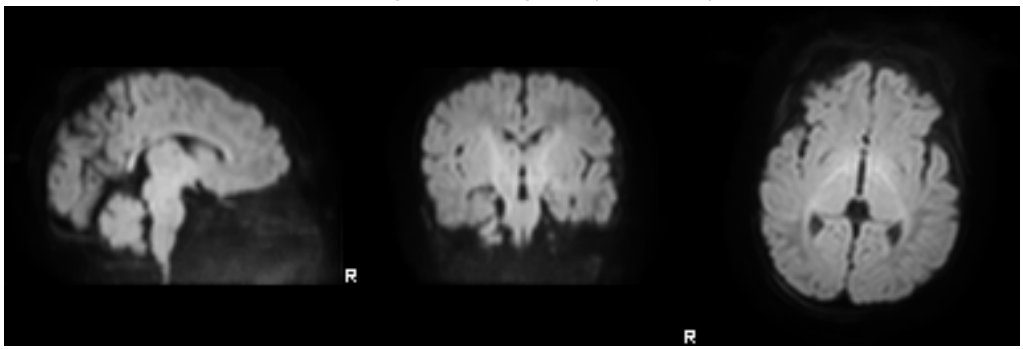
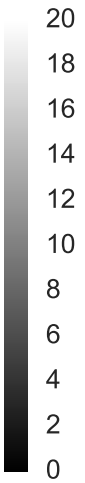
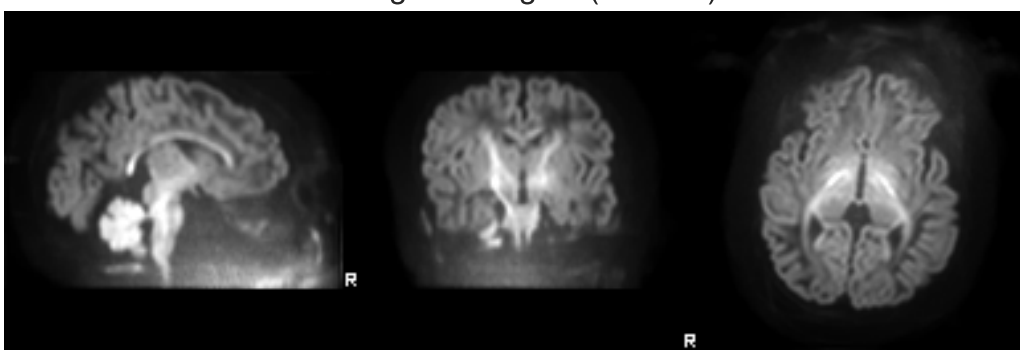
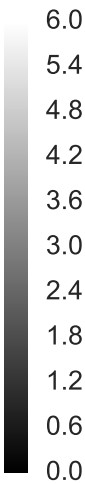




Average DW signal (b=2600)





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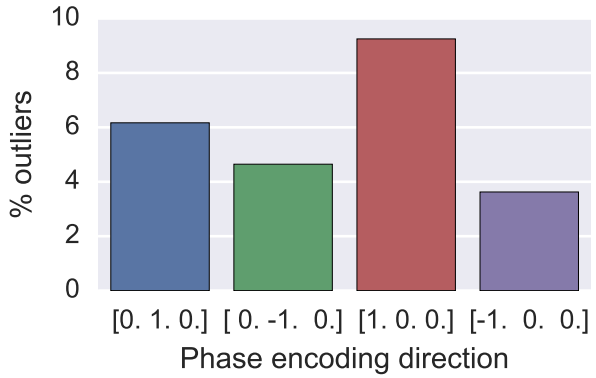

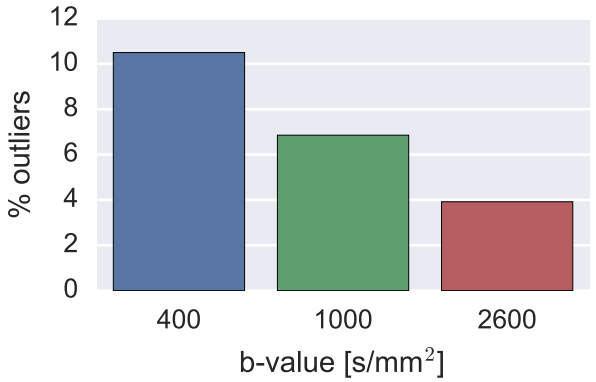

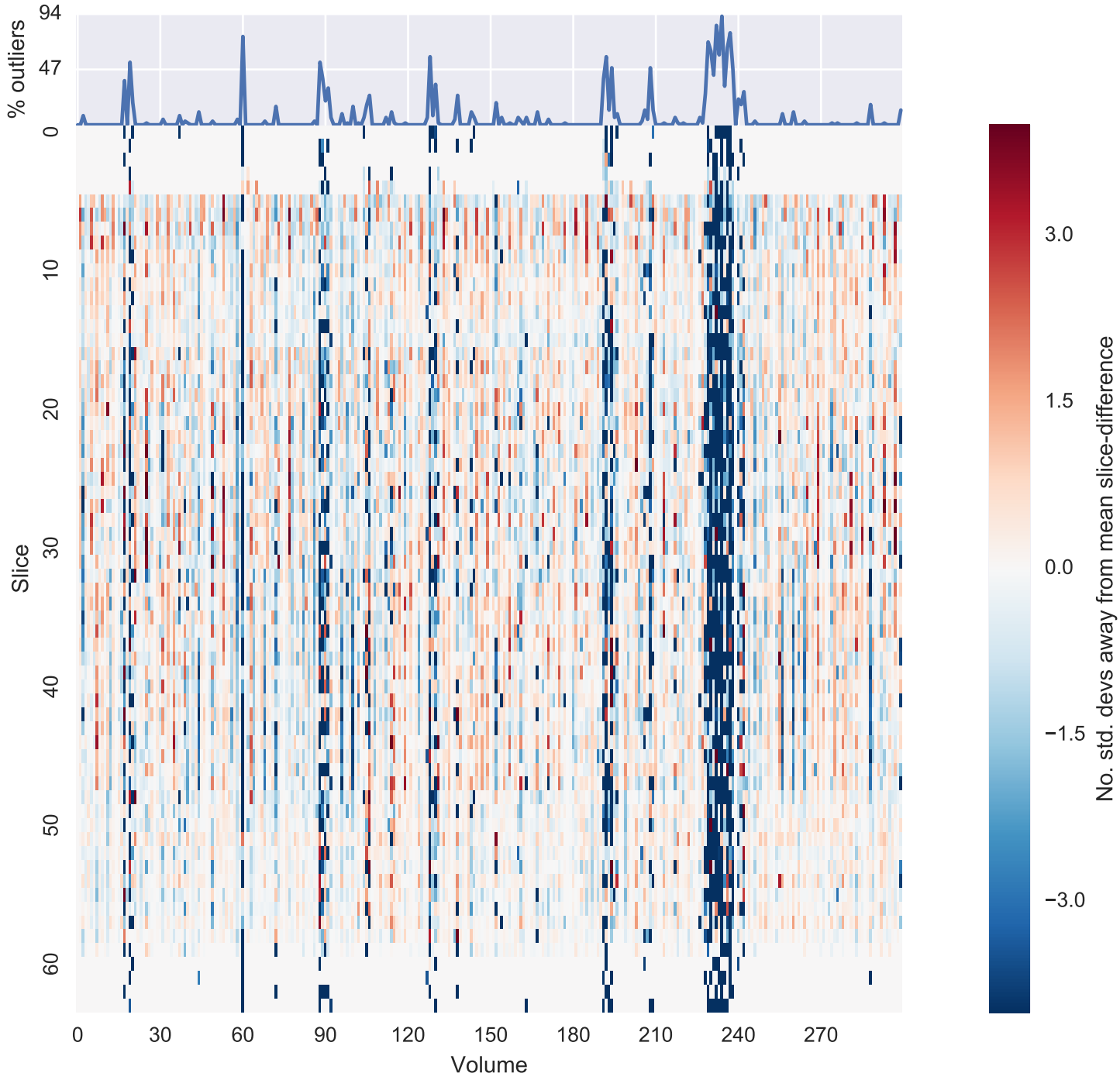

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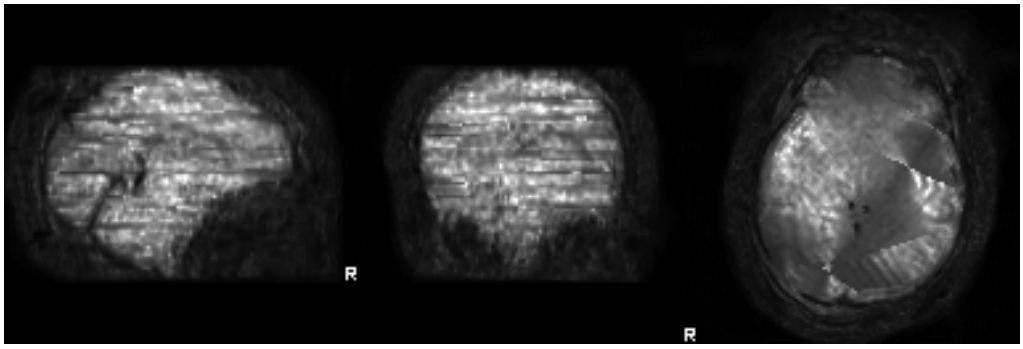
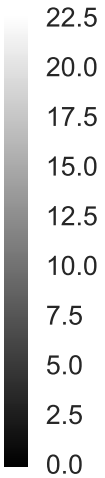
tSNR map (b=0)





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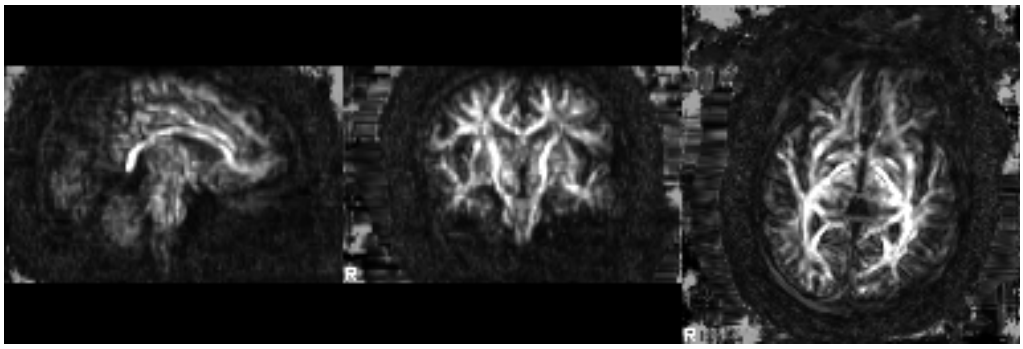
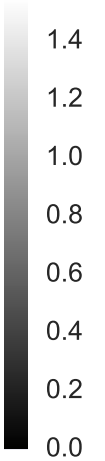
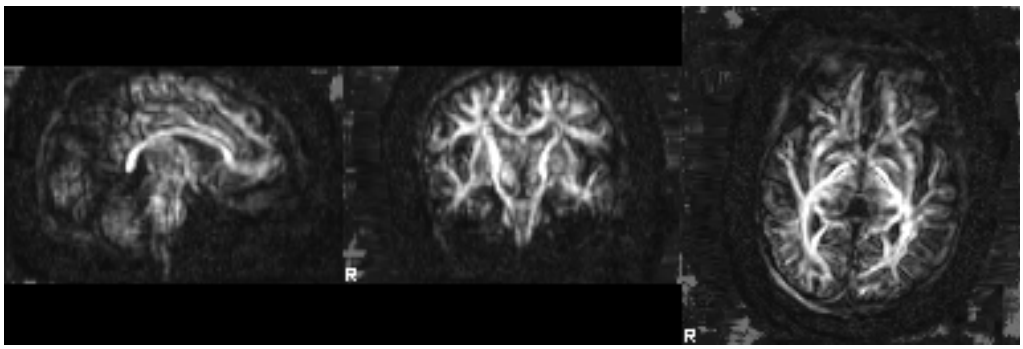




CNR map (b=1000)



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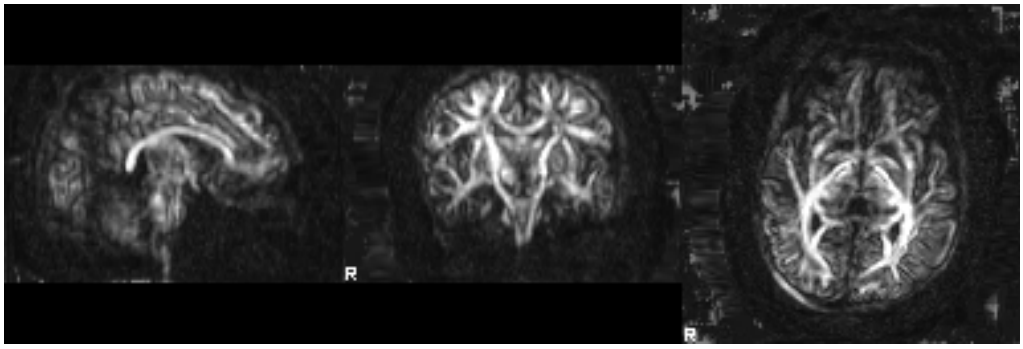

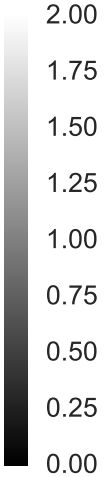

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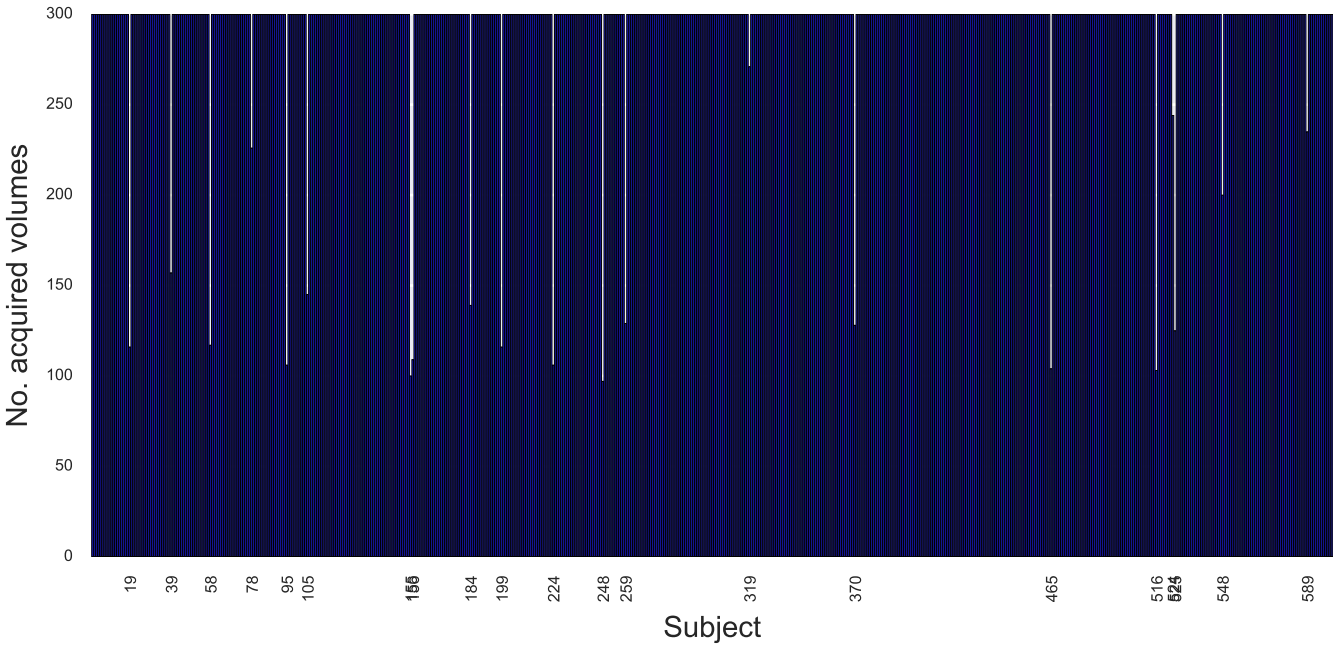

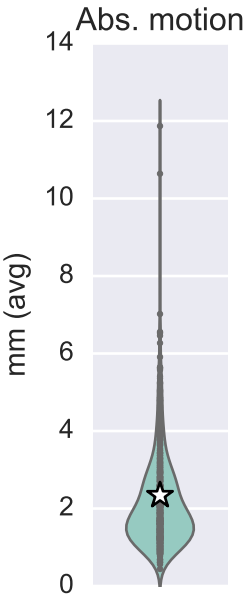

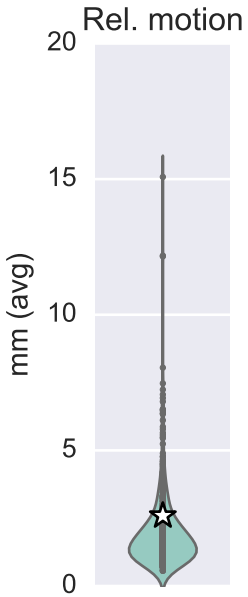

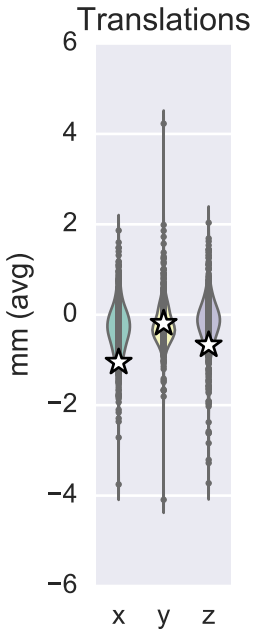

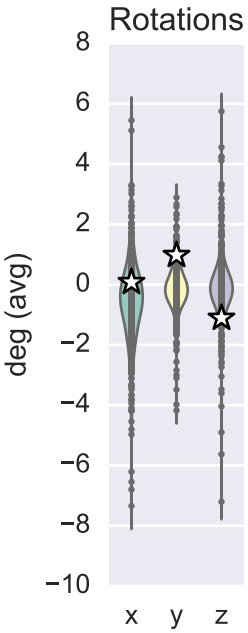

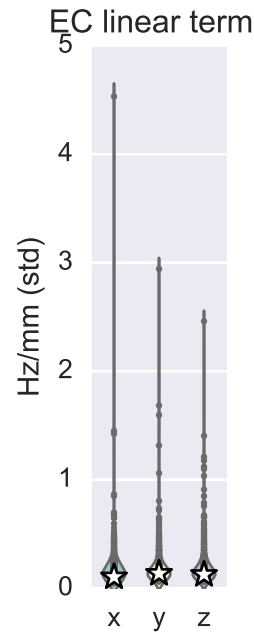

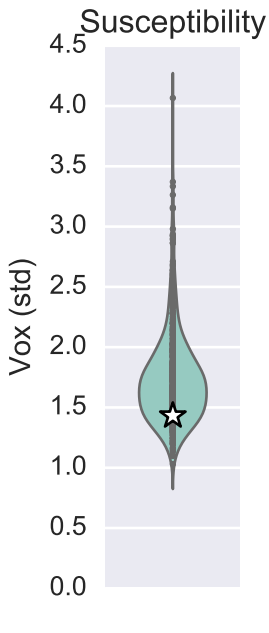

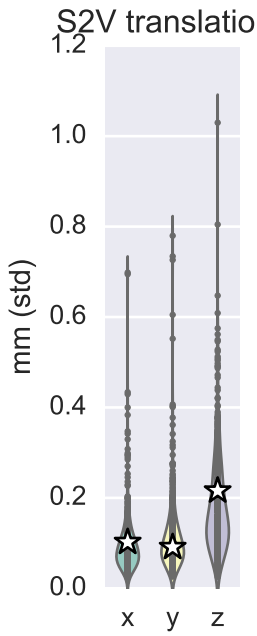

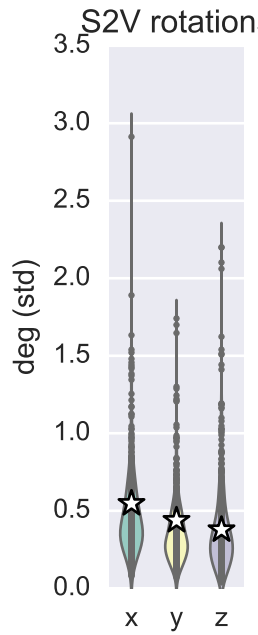
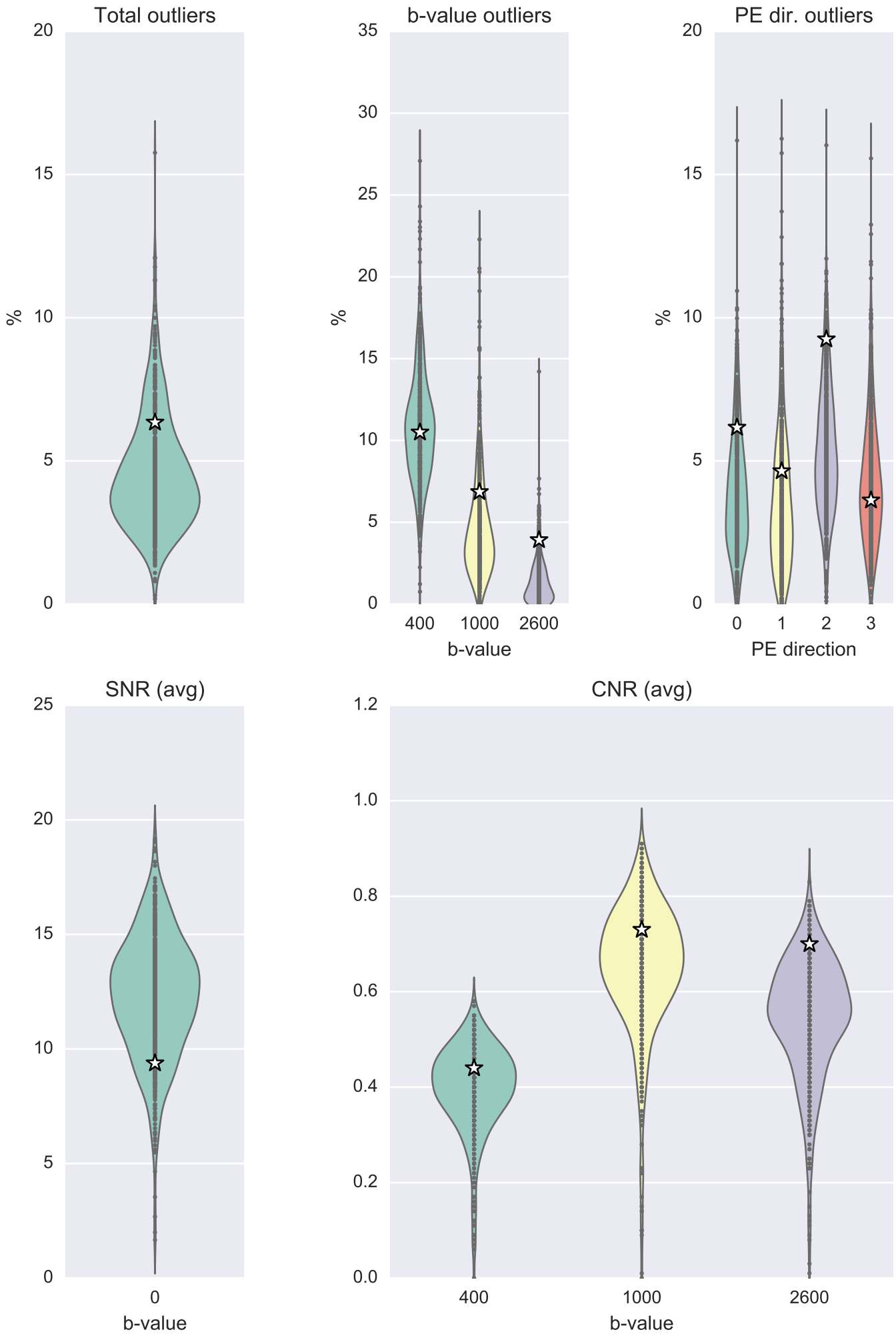
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