

## Supplemental Materials

### 1. FLAIR Reconstruction

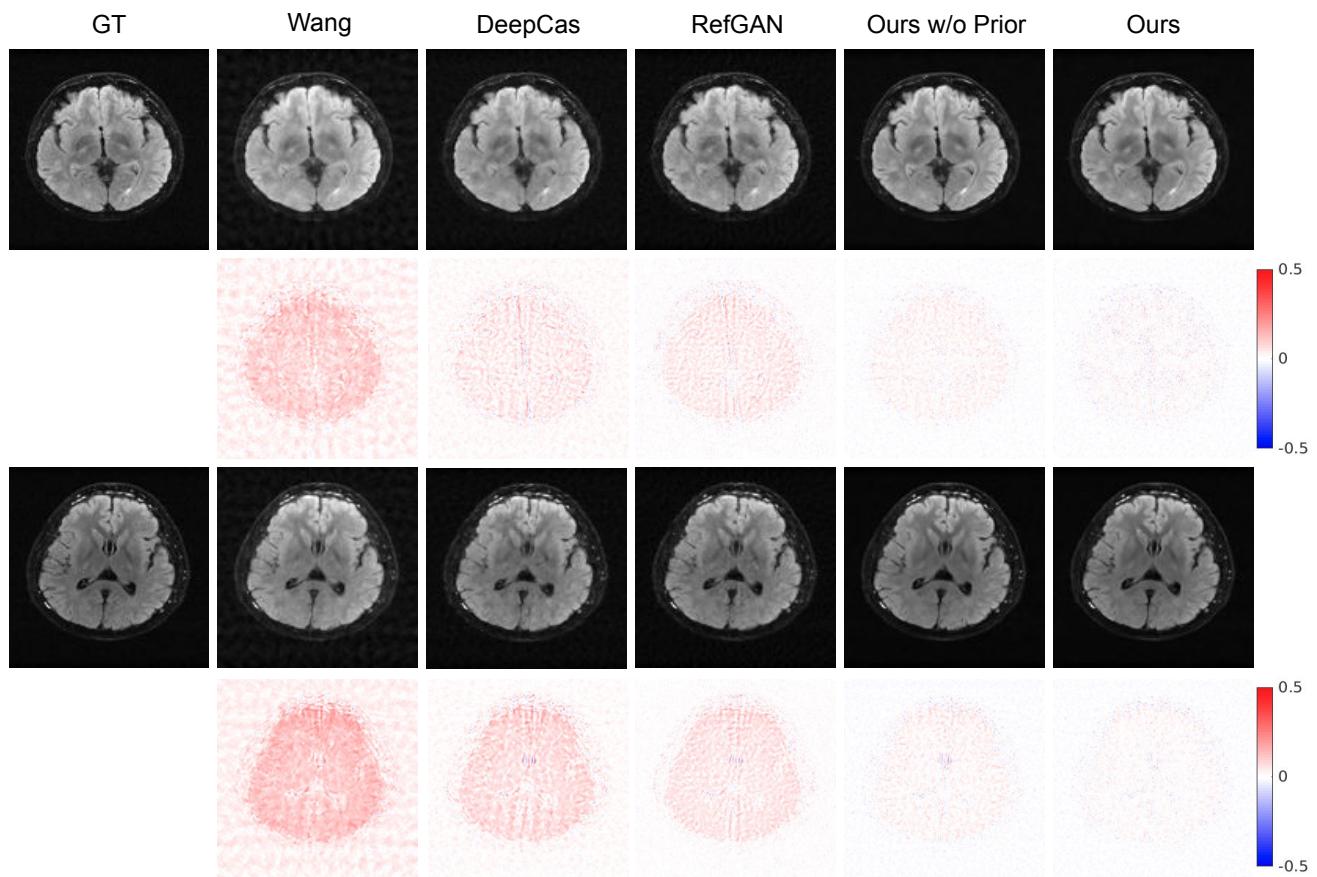


Figure 1: Comparison of reconstructions using radial trajectory at an acceleration rate  $R = 5$ .

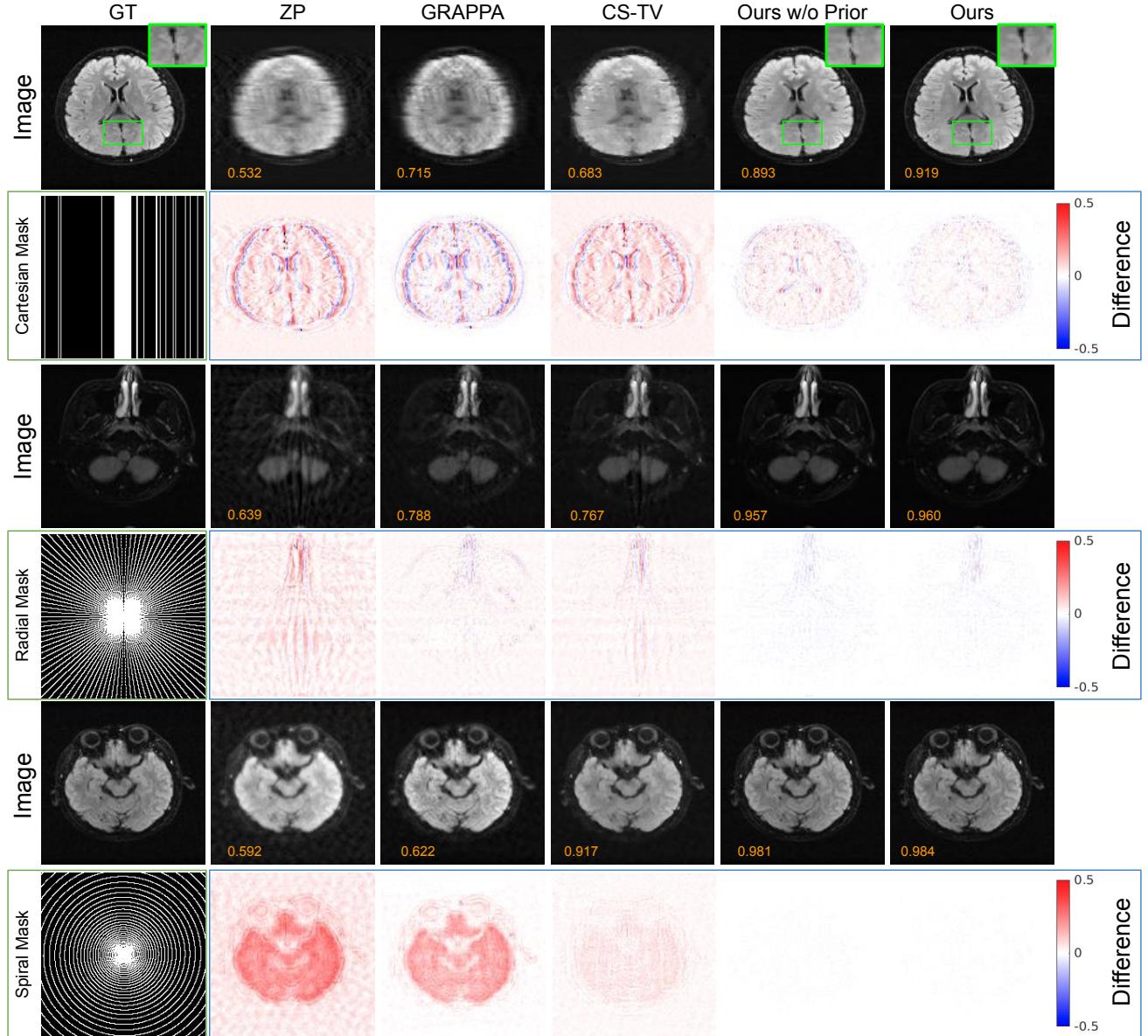


Figure 2: Reconstruction results from Cartesian/Radial/Spiral trajectory at under-sampling rate  $R = 5$ . The sampling pattern mask and difference images are shown on the second, fourth, and sixth row. Red boxes illustrate the enlarged views on details. The SSIM is indicated on the bottom left of the image.

Table 1: Quantitative comparison of FLAIR reconstructions from different undersampling patterns and methods at  $R = 5$ . Best results with and without T1 prior are marked in **red** and **blue**, respectively.

Cartesian	ZP	GRAPPA[1]	TV[2]	Wang[5]	DeepCas[4]	RefGAN[3]	Ours w/o Prior	Ours
PSNR [dB]	20.110	22.737	21.373	23.275	27.853	27.991	<b>29.063</b>	<b>30.562</b>
SSIM	0.608	0.733	0.696	0.772	0.864	0.868	<b>0.889</b>	<b>0.914</b>
MSE( $\times 10^2$ )	1.241	0.701	0.949	0.682	0.217	0.201	<b>0.165</b>	<b>0.106</b>
Radial	ZP	GRAPPA	TV	Wang	DeepCas	RefGAN	Ours w/o Prior	Ours
PSNR [dB]	20.178	24.920	23.685	29.201	32.955	32.04	<b>35.834</b>	<b>36.369</b>
SSIM	0.522	0.742	0.699	0.879	0.922	0.919	<b>0.943</b>	<b>0.951</b>
MSE( $\times 10^2$ )	1.268	0.541	0.561	0.108	0.038	0.071	<b>0.028</b>	<b>0.026</b>
Spiral	ZP	GRAPPA	TV	Wang	DeepCas	RefGAN	Ours w/o Prior	Ours
PSNR [dB]	22.602	29.324	32.836	34.987	40.287	36.881	<b>43.740</b>	<b>43.988</b>
SSIM	0.737	0.896	0.917	0.922	0.971	0.963	<b>0.983</b>	<b>0.987</b>
MSE( $\times 10^2$ )	0.857	0.291	0.064	0.048	0.011	0.021	<b>0.005</b>	<b>0.004</b>

## References

- [1] Mark A Griswold, Peter M Jakob, Robin M Heidemann, Mathias Nittka, Vladimir Jellus, Jianmin Wang, Berthold Kiefer, and Axel Haase. Generalized autocalibrating partially parallel acquisitions (grappa). *Magnetic Resonance in Medicine: An Official Journal of the International Society for Magnetic Resonance in Medicine*, 47(6):1202–1210, 2002. [3](#)
- [2] Shiqian Ma, Wotao Yin, Yin Zhang, and Amit Chakraborty. An efficient algorithm for compressed mr imaging using total variation and wavelets. In *2008 IEEE Conference on Computer Vision and Pattern Recognition*, pages 1–8. IEEE, 2008. [3](#)
- [3] Tran Minh Quan, Thanh Nguyen-Duc, and Won-Ki Jeong. Compressed sensing mri reconstruction using a generative adversarial network with a cyclic loss. *IEEE transactions on medical imaging*, 37(6):1488–1497, 2018. [3](#)
- [4] Jo Schlemper, Jose Caballero, Joseph V Hajnal, Anthony N Price, and Daniel Rueckert. A deep cascade of convolutional neural networks for dynamic mr image reconstruction. *IEEE transactions on Medical Imaging*, 37(2):491–503, 2017. [3](#)
- [5] Shanshan Wang, Zhenghang Su, Leslie Ying, Xi Peng, Shun Zhu, Feng Liang, Dagan Feng, and Dong Liang. Accelerating magnetic resonance imaging via deep learning. In *2016 IEEE 13th International Symposium on Biomedical Imaging (ISBI)*, pages 514–517. IEEE, 2016. [3](#)