

# Supplementary Material (Appendix) for AC-IND: Sparse CT reconstruction based on attenuation coefficient estimation and implicit neural distribution

## 1. Visual Comparison on Ellipse Material Dataset

Fig. 1 and Fig. 2 show the reconstruction of different methods(FBP [2], SIRT [1], Classical INR [3,4]) on the Ellipse Material Dataset. The PSNR/SSIM values of AC-IND(Ours) are marked in yellow. The PSNR/SSIM values of AC-IND+(Ours+) are marked in red. Our work doesn't include settings with complex overlapping materials. As stated in the main paper, our work needs access the total amount of materials in the object, which is easily accessible and generally a basic attribute of industrial objects.

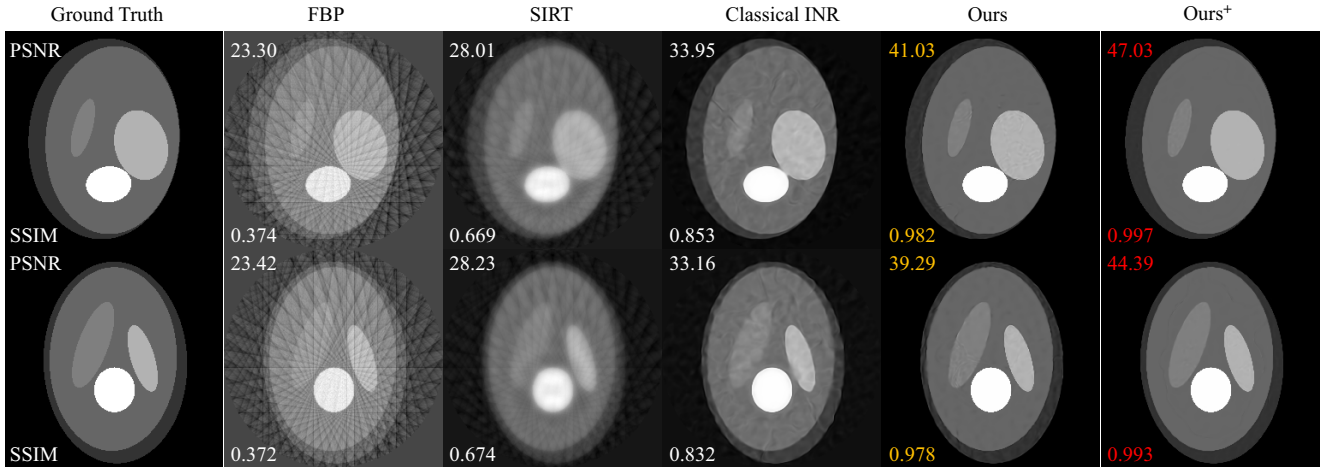


Figure 1. Comparison of different reconstruction under **20 views** setting, please **zoom in** to see more details.

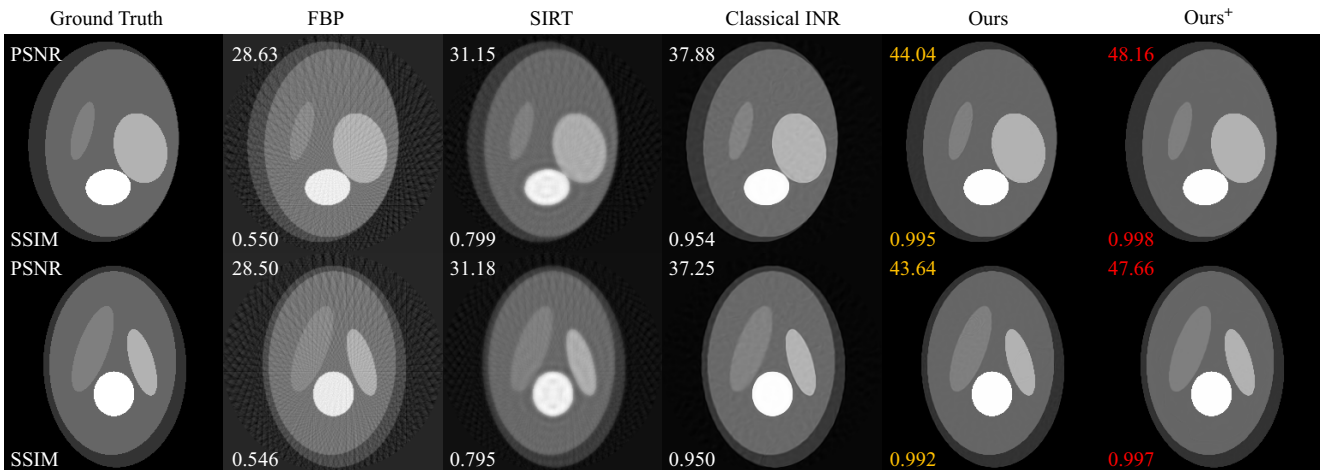


Figure 2. Comparison of different reconstruction under **40 views** setting, please **zoom in** to see more details.

## 2. Visual Comparison on Walnut Slice Dataset

Fig. 3, Fig. 4 and Fig. 5 show the reconstruction results of different methods(FBP, SIRT, Classical INR) on the Walnut Slice Dataset. In addition, the semantic segmentation maps automatically generated by AC-IND are also shown in Fig. 3, Fig. 4 and Fig. 5. The PSNR/SSIM values of AC-IND(Ours) are marked in red. Please **zoom in** to see more details.

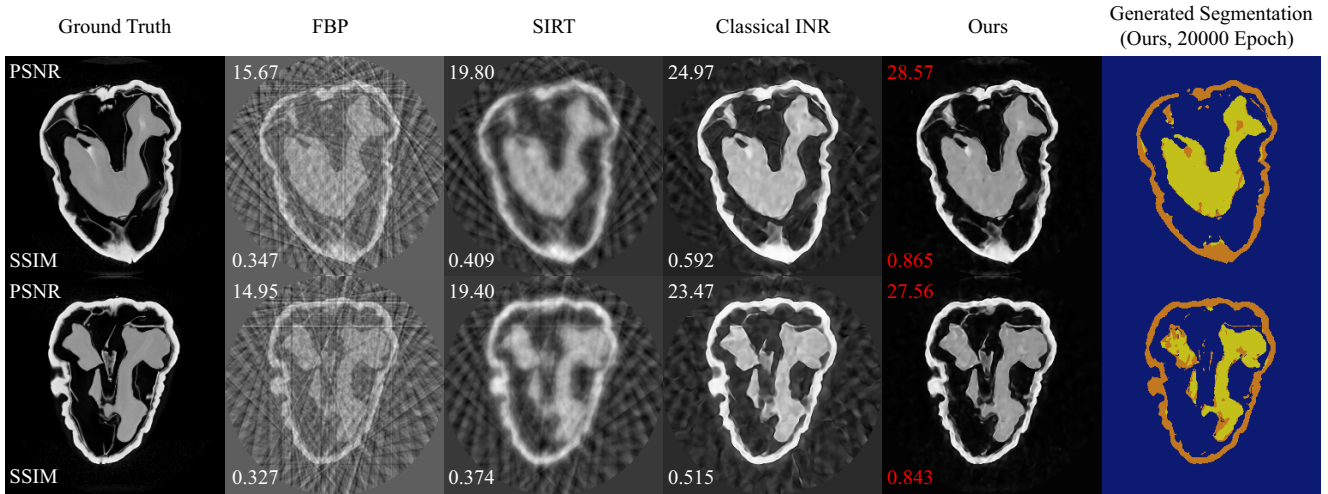


Figure 3. Comparison of different reconstruction under **20 views** setting, and the segmentation map generated by our method.

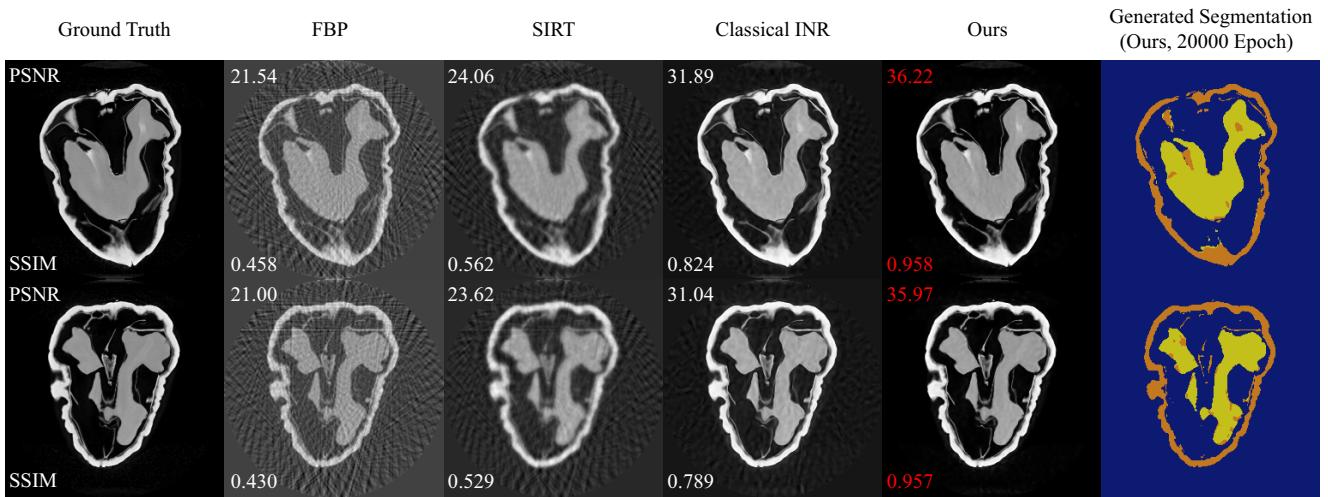


Figure 4. Comparison of different reconstruction under **40 views** setting, and the segmentation map generated by our method.

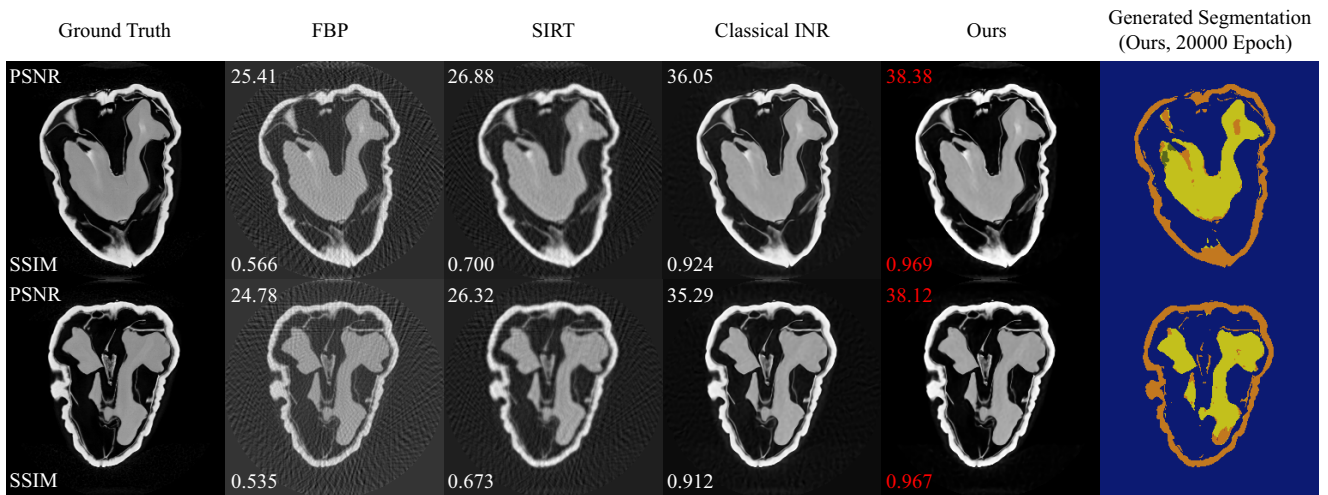


Figure 5. Comparison of different reconstruction under **60 views** setting, and the segmentation map generated by our method.

## References

- [1] Jens Gregor and Thomas Benson. Computational analysis and improvement of sirt. *IEEE transactions on medical imaging*, 27(7):918–924, 2008. [1](#)
- [2] Gabor T Herman. *Fundamentals of computerized tomography: image reconstruction from projections*. Springer Science & Business Media, 2009. [1](#)
- [3] Vincent Sitzmann, Julien Martel, Alexander Bergman, David Lindell, and Gordon Wetzstein. Implicit neural representations with periodic activation functions. *Advances in neural information processing systems*, 33:7462–7473, 2020. [1](#)
- [4] Matthew Tancik, Pratul P. Srinivasan, Ben Mildenhall, Sara Fridovich-Keil, Nithin Raghavan, Utkarsh Singhal, Ravi Ramamoorthi, Jonathan T. Barron, and Ren Ng. Fourier features let networks learn high frequency functions in low dimensional domains. *NeurIPS*, 2020. [1](#)