A Appendix: Effect of $\mathcal{A}_0$ in Reconstruction

In addition, we show that our proposed methods are less sensitive to the quality of the initial forward model. We demonstrate the idea using the image deblurring task, where one has flexibility in choosing the initial forward model. Assuming the true forward model for an image deblurring problem has a Gaussian kernel size of 5 with a variance of 7, we consider initial forward models $\boldsymbol{A}_0$ constructed with Gaussian kernels of sizes 5, but variances of 1, 3, 5, and 7. Figure 9 illustrates the reconstruction results with different $\boldsymbol{A}_0$'s for each method. When $\boldsymbol{A}_0$ deviates from $\boldsymbol{A}$, robust LU exhibits noticeable artifacts (with $\sigma = 1$ and 3), while our proposed methods show minimal degradation in quality even with significant differences between $\boldsymbol{A}_0$ and $\boldsymbol{A}$. This is due to the adaptive nature of our methods in iteratively addressing model mismatches. Notice that $\sigma = 1$ and 3 are treated as extreme cases, which were never encountered in $\boldsymbol{A}$ and $\boldsymbol{A}_0$ during training. The proposed methods generalize better to unseen estimated forward models.

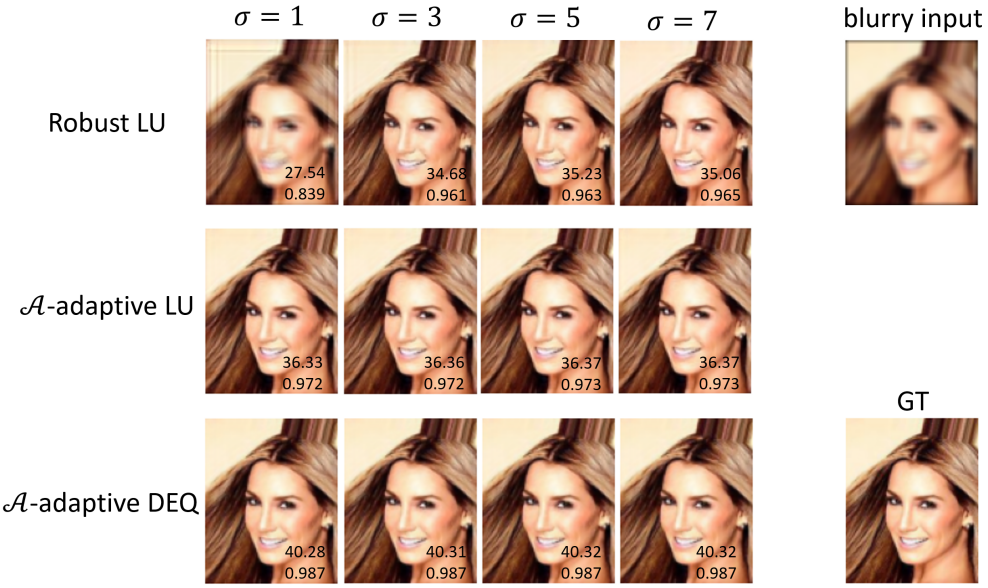

Figure 9: Visualizing the deblurred images using different $\boldsymbol{A}_0$, where σ denotes the variance of the Gaussian kernel of the estimated forward model. The numbers in each image denote the PSNR and SSIM values.