

Table 1: **More detailed ablation studies on our designs.** On LLFF dataset and w/ GIM prior.

Method	PSNR $\uparrow$	SSIM $\uparrow$	LPIPS $\downarrow$	AVG $\downarrow$
3DGS (baseline)	16.46	0.440	0.401	0.192
+ Hybrid Rep.	18.62	0.607	0.273	0.138
+ Rend. Geo.	19.40	0.634	0.259	0.127
+ Dual optim.	20.77	0.705	0.218	0.105

Table 2: **Robustness to different matching models.** Conducted on LLFF dataset.

Method	PSNR $\uparrow$	SSIM $\uparrow$	LPIPS $\downarrow$	AVG $\downarrow$
Ours + GIM	20.77	0.705	0.218	0.105
Ours + DKM	20.92	0.732	0.189	0.099
Ours + LoFTR	20.94	0.737	0.182	0.097
Ours + SuperGlue	20.25	0.689	0.221	0.110

Table 3: **Comparisons with methods of directly initializing with triangulation points.** On LLFF.

Method	PSNR $\uparrow$	SSIM $\uparrow$	LPIPS $\downarrow$	AVG $\downarrow$
3DGS (baseline)	16.46	0.440	0.401	0.192
Triang. init + 3DGS	19.11	0.643	0.335	0.140
Triang. init + ScaffoldGS	19.41	0.699	0.217	0.118
Triang. init + OctreeGS	19.61	0.710	0.210	0.114
Ours	20.77	0.705	0.218	0.105

Table 4: **Comparisons on the texture-poor DTU dataset with 3 training views.**

Method	PSNR $\uparrow$	SSIM $\uparrow$	LPIPS $\downarrow$	AVG $\downarrow$
FreeNeRF	19.92	0.787	0.182	0.098
SparseNeRF	19.55	0.769	0.201	0.102
DNGaussian	18.91	0.790	0.176	0.102
Ours	20.56	0.864	0.122	0.078

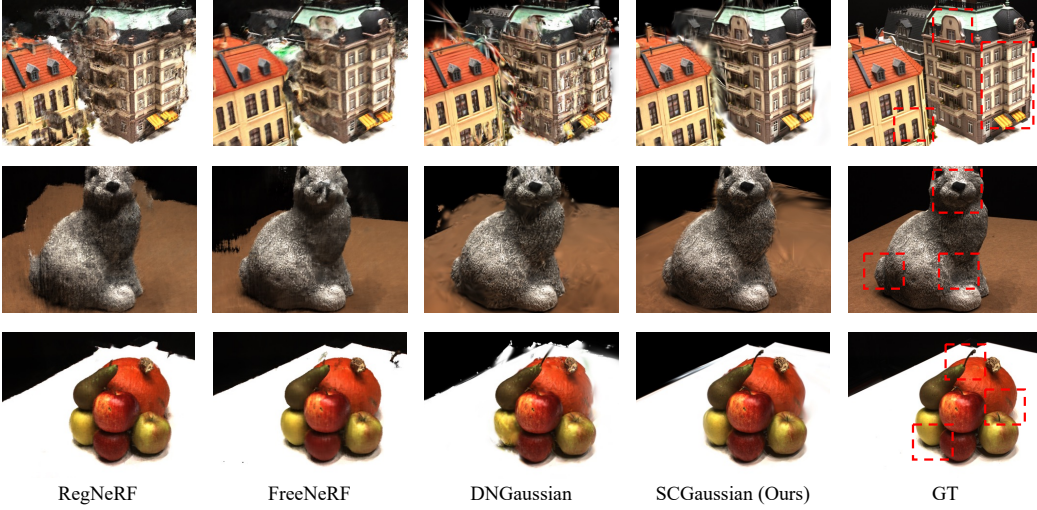


Figure 1: **Qualitative comparisons on DTU dataset with 3 training views.**

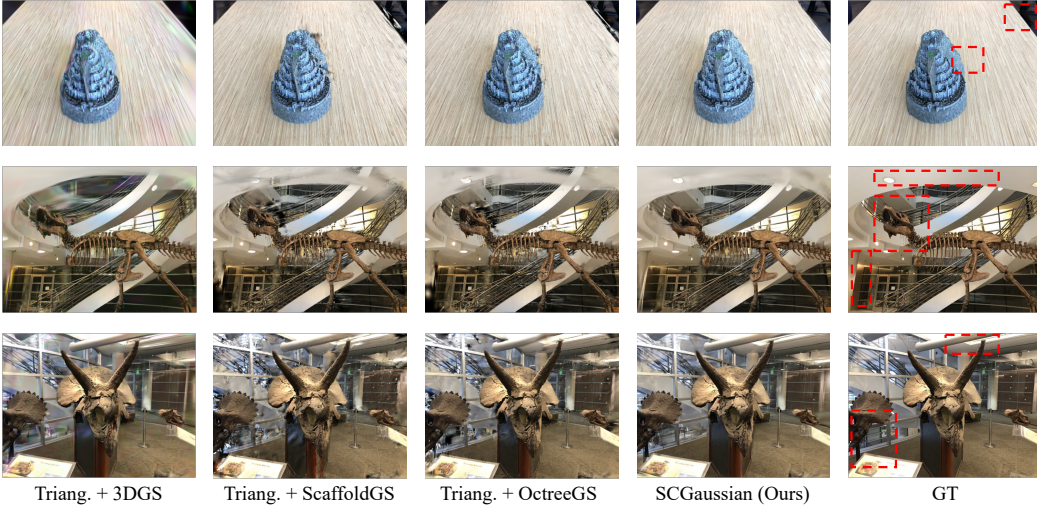


Figure 2: **Qualitative comparisons with methods of directly initializing 3DGS, ScaffoldGS and OctreeGS with triangulation points on LLFF dataset with 3 training views.**



Figure 3: **Qualitative comparisons on Waymo dataset with 5 training views.**