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# Synthesizing Complex-Valued Multicoil MRI Data from Magnitude-only Images

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**Table S1.** PSNR values for VarNet trained on different types of phase at various acceleration factors for the 16-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground truth | 32.915 | 29.995 | 28.4529 | 27.692 |
| Synthetic Phase (ours) | **31.196** | **28.602** | **28.039** | **26.378** |
| Sinusoidal Phase | 23.652 | 23.229 | 22.99 | 22.590 |
| Random Phase | 23.938 | 22.255 | 22.028 | 22.581 |
| Zero Phase | 23.911 | 23.589 | 22.976 | 21.518 |

**Table S2.** PSNR values for VarNet trained on different types of phase at various acceleration factors for the 20-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase Type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground Truth | 32.605 | 30.0454 | 28.367 | 27.747 |
| Synthetic Phase(ours) | **30.484** | **29.712** | **27.054** | **26.314** |
| Sinusoidal Phase | 23.068 | 22.576 | 22.255 | 22.020 |
| Random Phase | 22.994 | 22.771 | 22.434 | 22.066 |
| Zero Phase | 2.947 | 22.74 | 22.388 | 21.826 |

**Table S3.** NMSE values for VarNet trained on different types of phase at various acceleration factors for the 16-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase Type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground Truth | 0.0133 | 0.0213 | 0.029295 | 0.03615 |
| Synthetic Phase (ours) | **0.0195** | **0.0309** | **0.0336** | **0.043** |
| Sinusoidal Phase | 0.096 | 0.099 | 0.108 | 0.115 |
| Random Phase | 0.093 | 0.102 | 0.103 | 0.116 |
| Zero Phase | 0.092 | 0.101 | 0.107 | 0.152 |

**Table S4.** NMSE values for VarNet trained on different types of phase at various acceleration factors for the 20-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase Type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground Truth | 0.0176 | 0.0244 | 0.0354 | 0.0383 |
| Synthetic Phase (ours) | **0.0265** | **0.0337** | **0.0520** | **0.0613** |
| Sinusoidal Phase | 0.249 | 0.253 | 0.263 | 0.304 |
| Random Phase | 0.247 | 0.2409 | 0.251 | 0.284 |
| Zero Phase | 0.266 | 0.230 | 0.243 | 0.301 |

**Table S5.** SSIM values for VarNet trained on different types of phase at various acceleration factors for the 16-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase Type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground Truth | 0.8425 | 0.816 | 0.773 | 0.767 |
| Synthetic Phase (ours) | 0.7468 | **0.745** | 0.6889 | 0.6511 |
| Sinusoidal Phase | **0.768** | 0.736 | **0.721** | **0.694** |
| Random Phase | 0.668 | 0.639 | 0.618 | 0.598 |
| Zero Phase | 0.668 | 0.645 | 0.617 | 0.546 |

**Table S6.** SSIM values for VarNet trained on different types of phase at various acceleration factors for the 20-coil dataset. Bold values indicate the best performing type of phase (not including ground truth).

| Phase Type | R=4 | R=6 | R=8 | R=10 |
|---|---|---|---|---|
| Ground Truth | 0.8189 | 0.790 | 0.731 | 0.722 |
| Synthetic Phase (ours) | **0.819** | **0.784** | **0.681** | **0.671** |
| Sinusoidal Phase | 0.701 | 0.687 | 0.674 | 0.655 |
| Random Phase | 0.708 | 0.687 | 0.669 | 0.652 |
| Zero Phase | 0.709 | 0.691 | 0.672 | 0.644 |