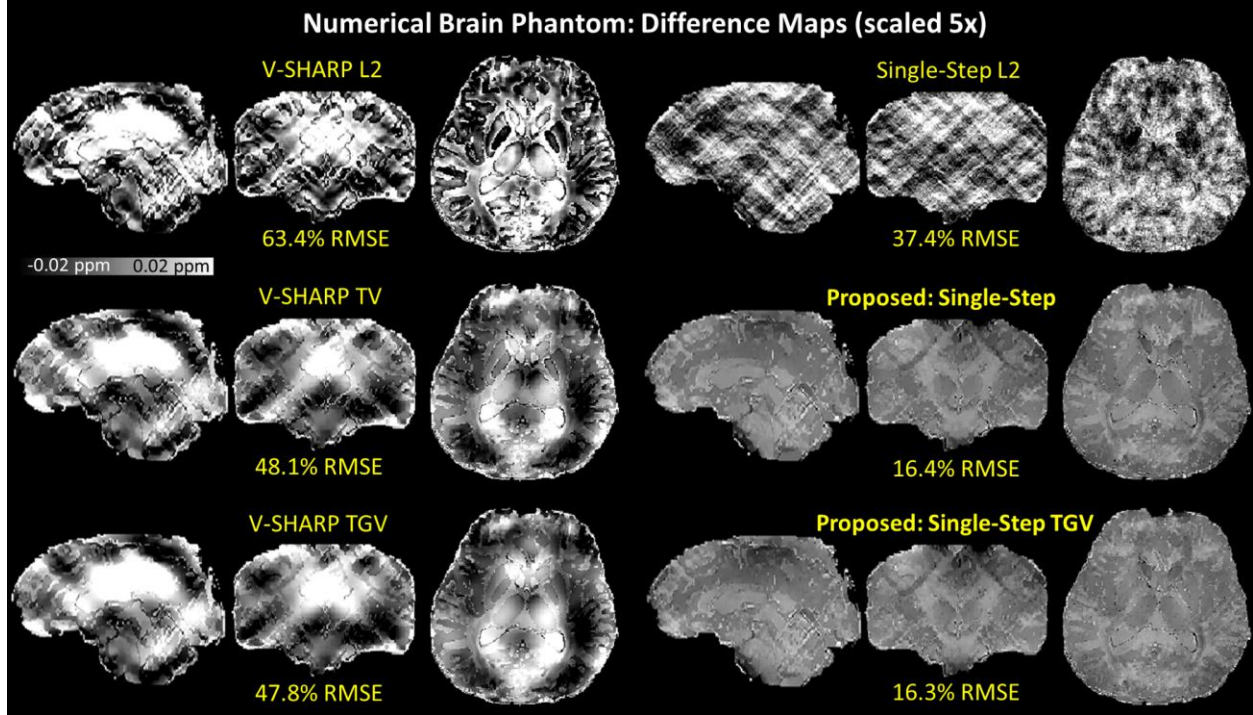
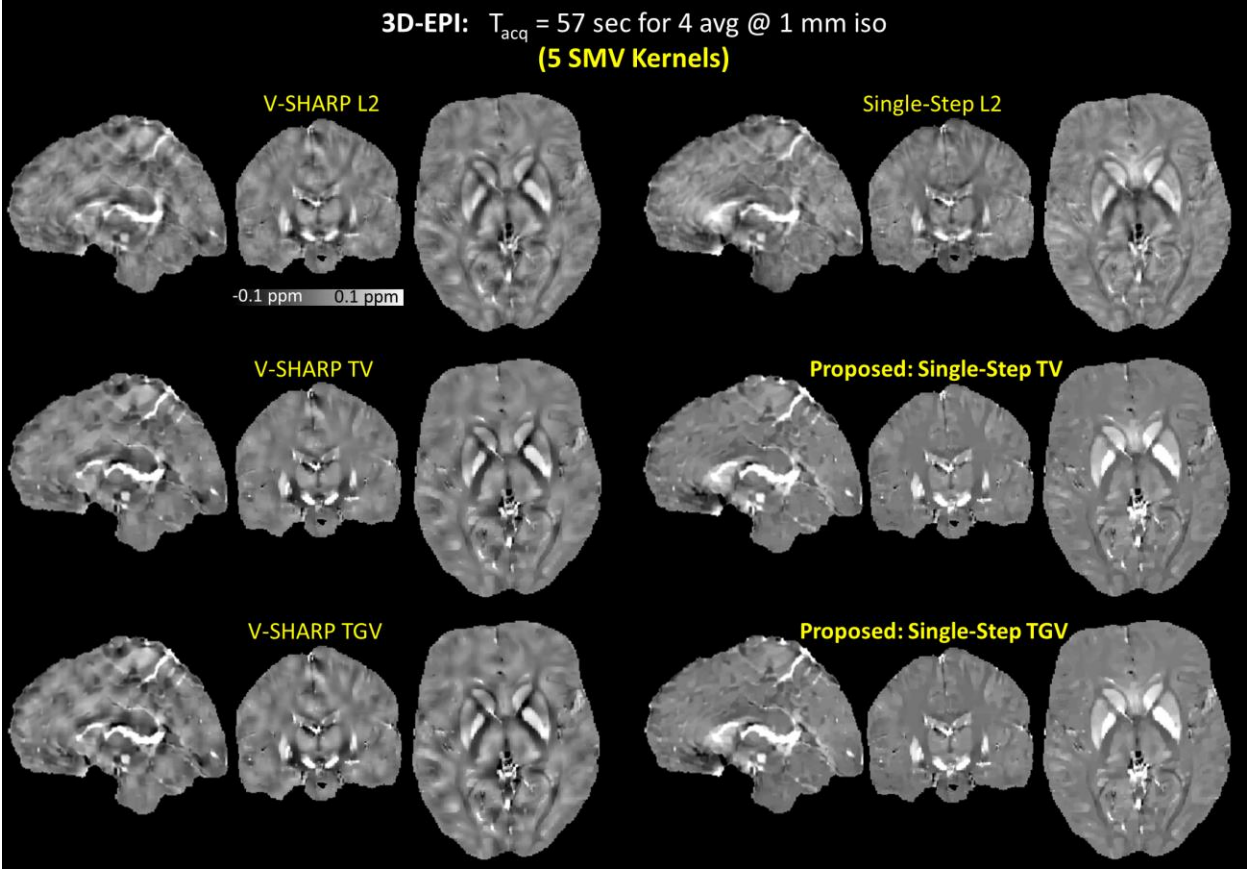


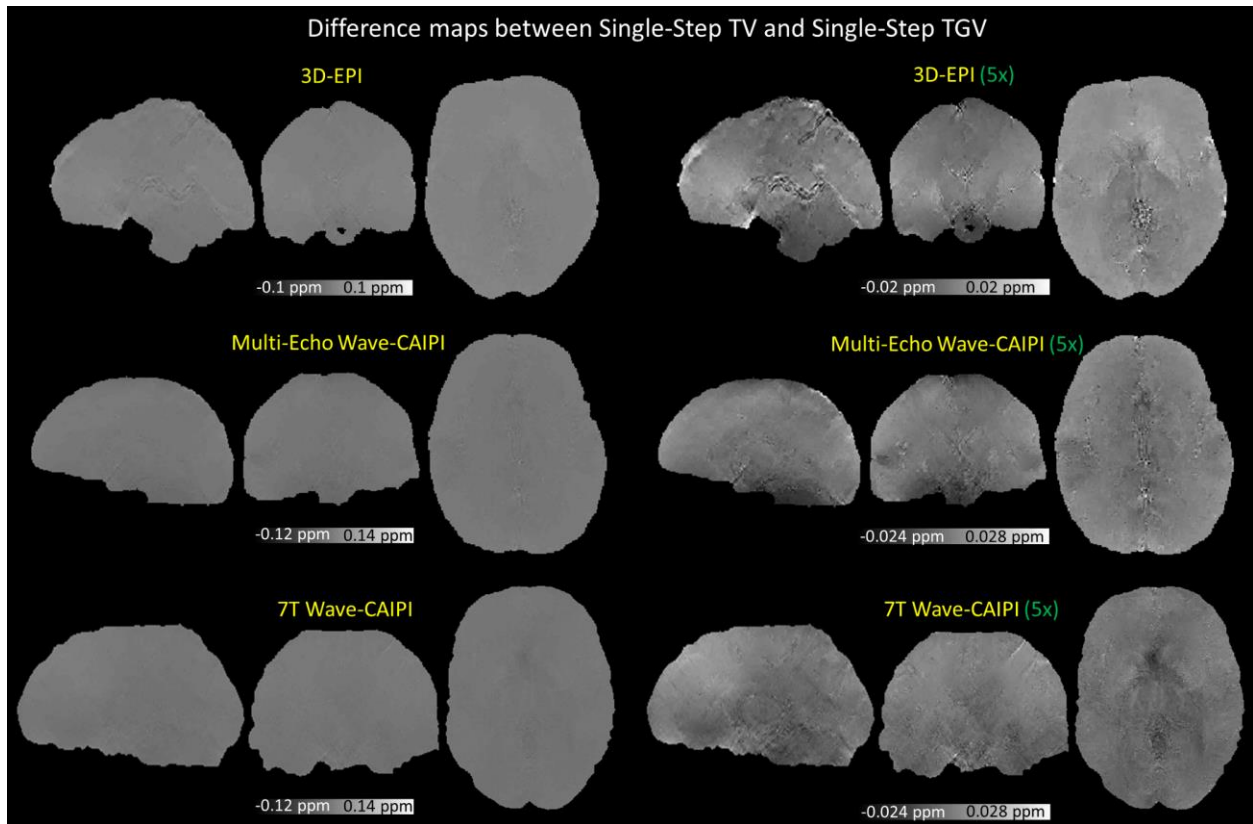
Supplementary Figure 1. Duke Brain Phantom. The difference maps between the reconstructed magnetic susceptibility maps and the underlying tissue susceptibility distribution with the corresponding RMSEs.



Supplementary Figure 2. Numerical Brain Phantom. The difference maps between the reconstructed magnetic susceptibility maps and the underlying tissue susceptibility distribution with the corresponding RMSEs.



Supplementary Figure 3. 3D-EPI. The reconstructed magnetic susceptibility maps obtained from six different QSM algorithms with 5 SMV kernels.



Supplementary Figure 4. *In vivo* data sets. The difference maps between the two proposed methods: Single-Step TV and Single-Step TGV.