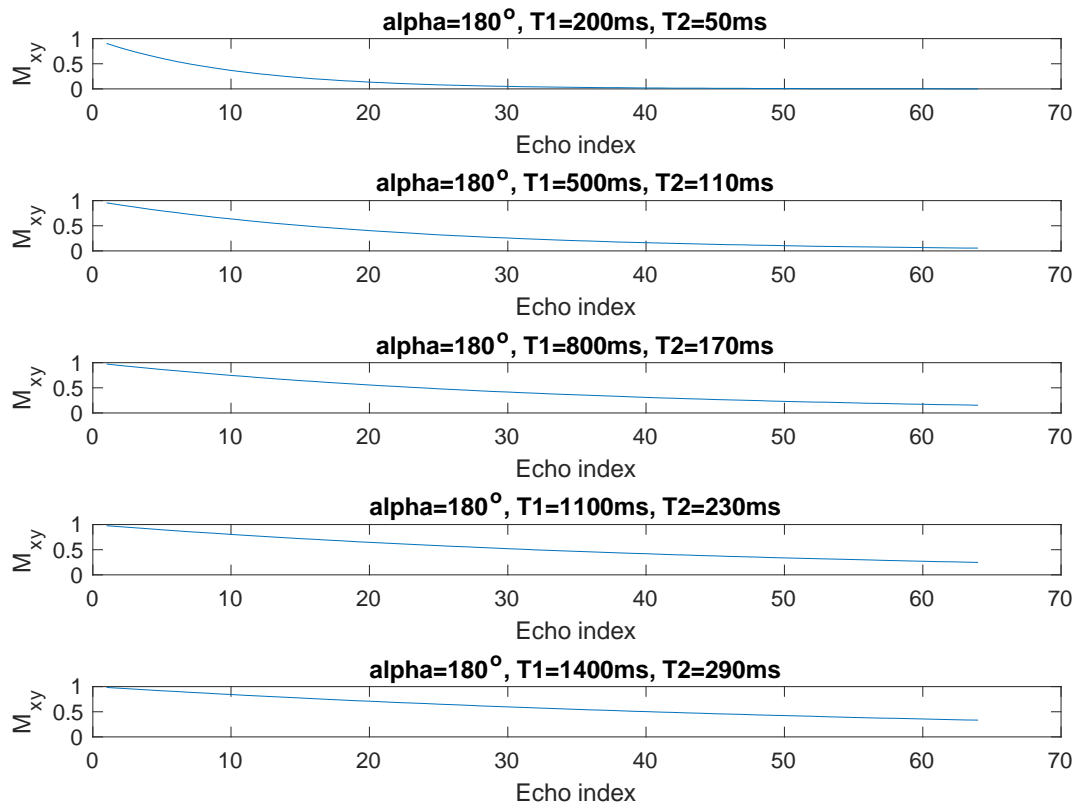
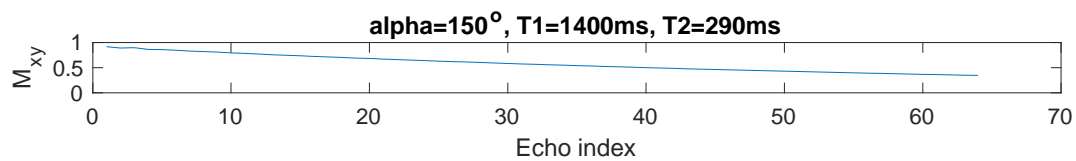
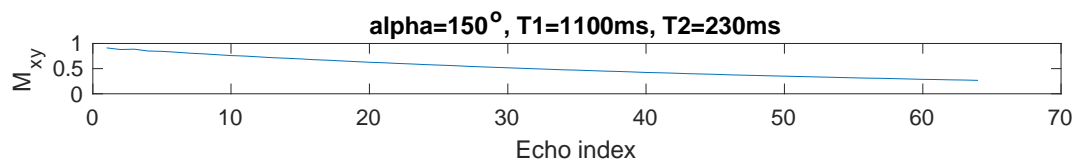
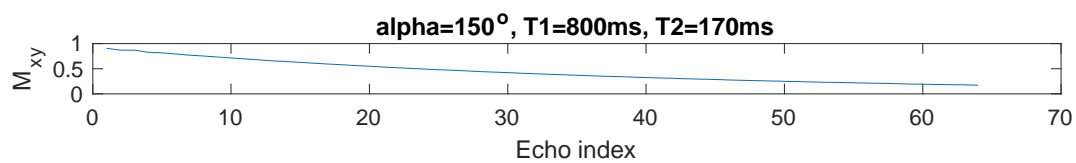
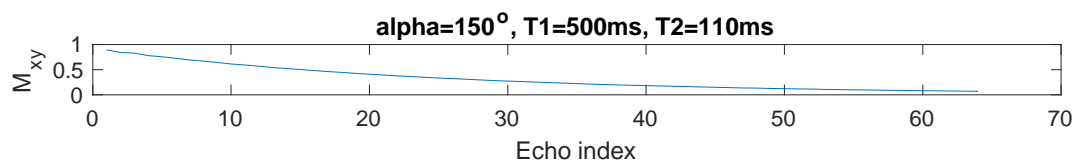
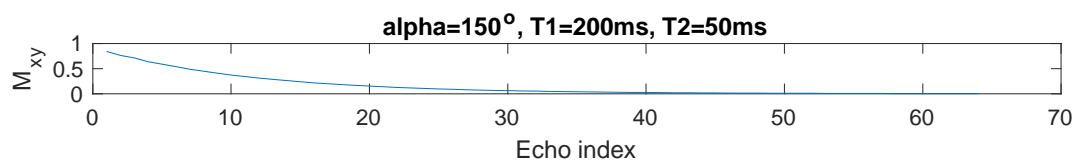


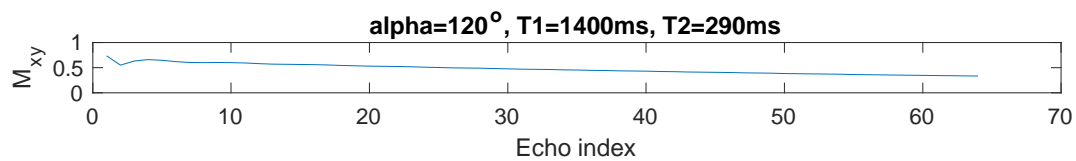
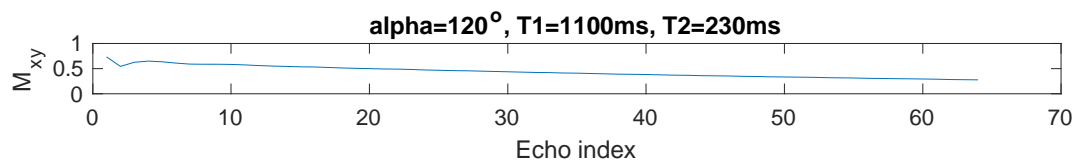
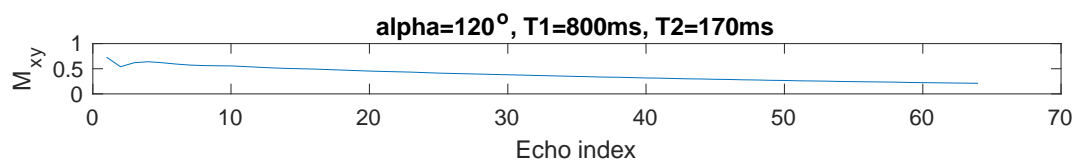
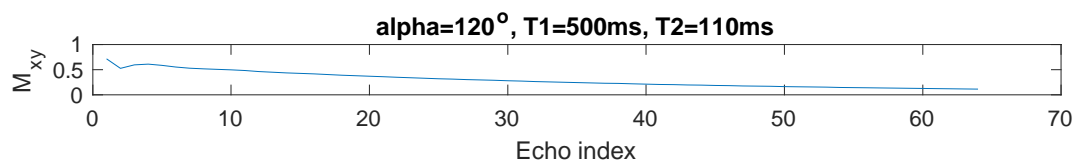
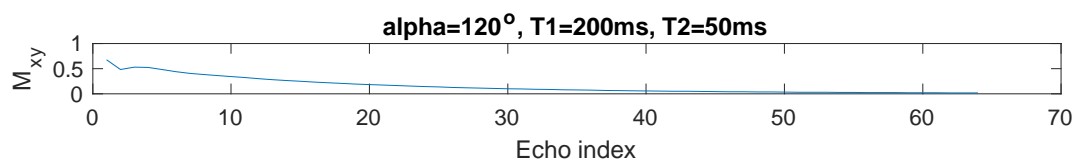
HW2

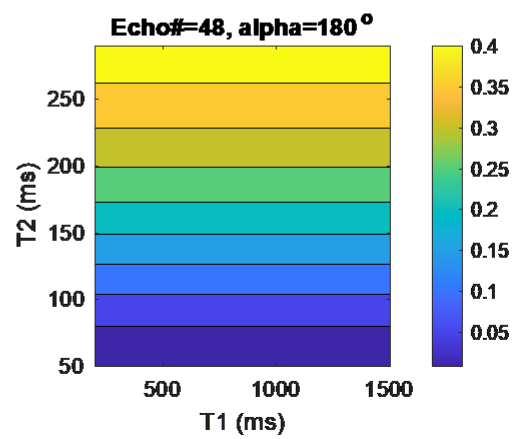
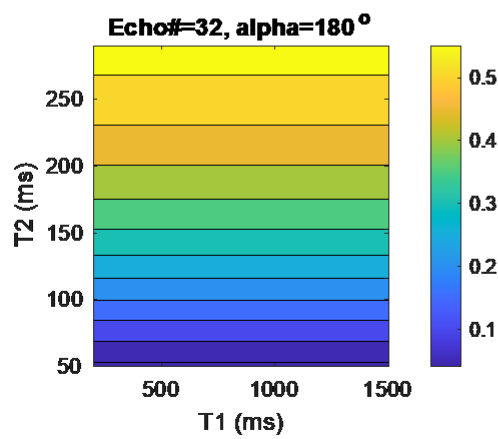
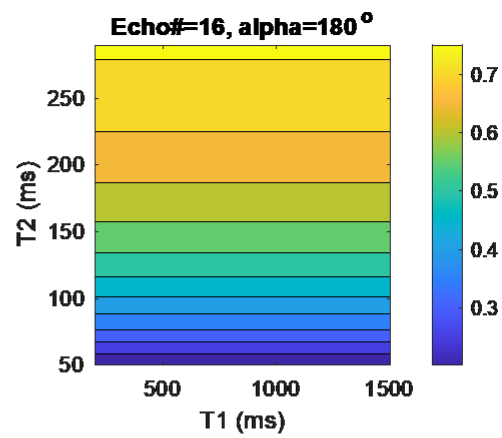
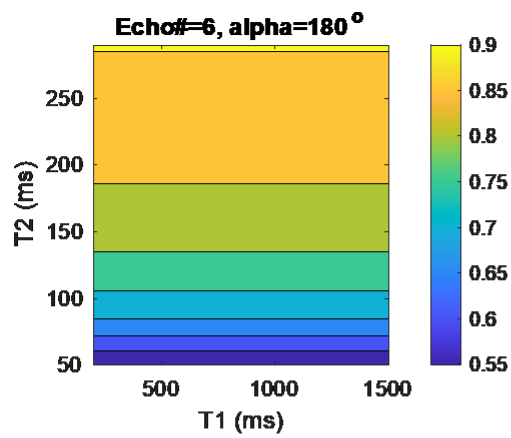
Problem 1

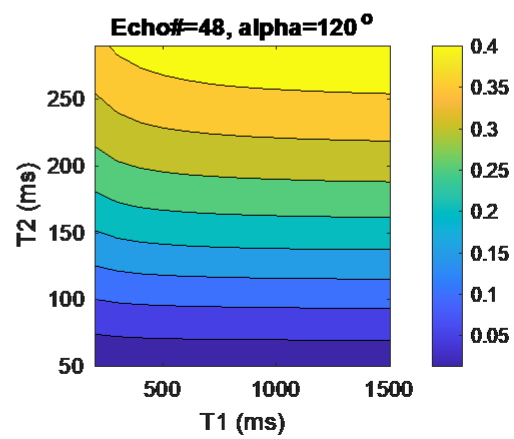
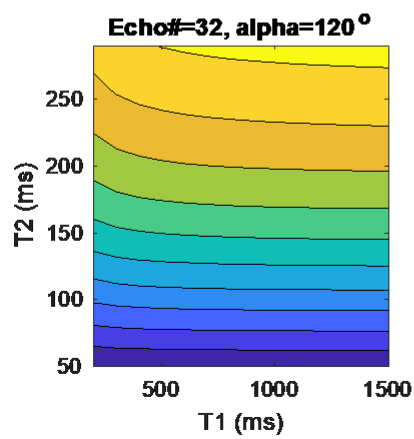
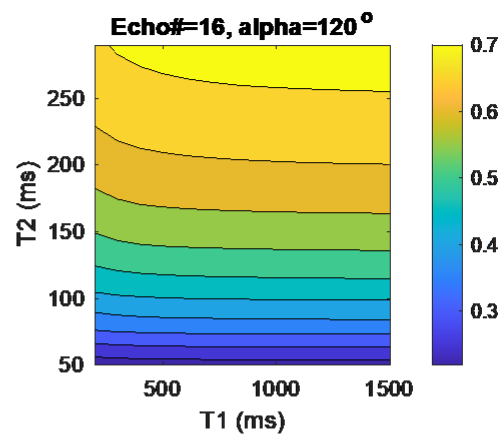
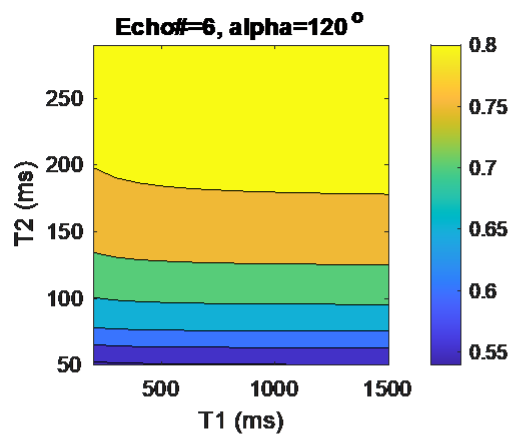
- From the contour plots, the three chosen alpha seem to produce contrast that are mostly T2 weighted, but at 60 and 120 alpha there is a bit more T1 weighting especially for lower ends of T1 values.

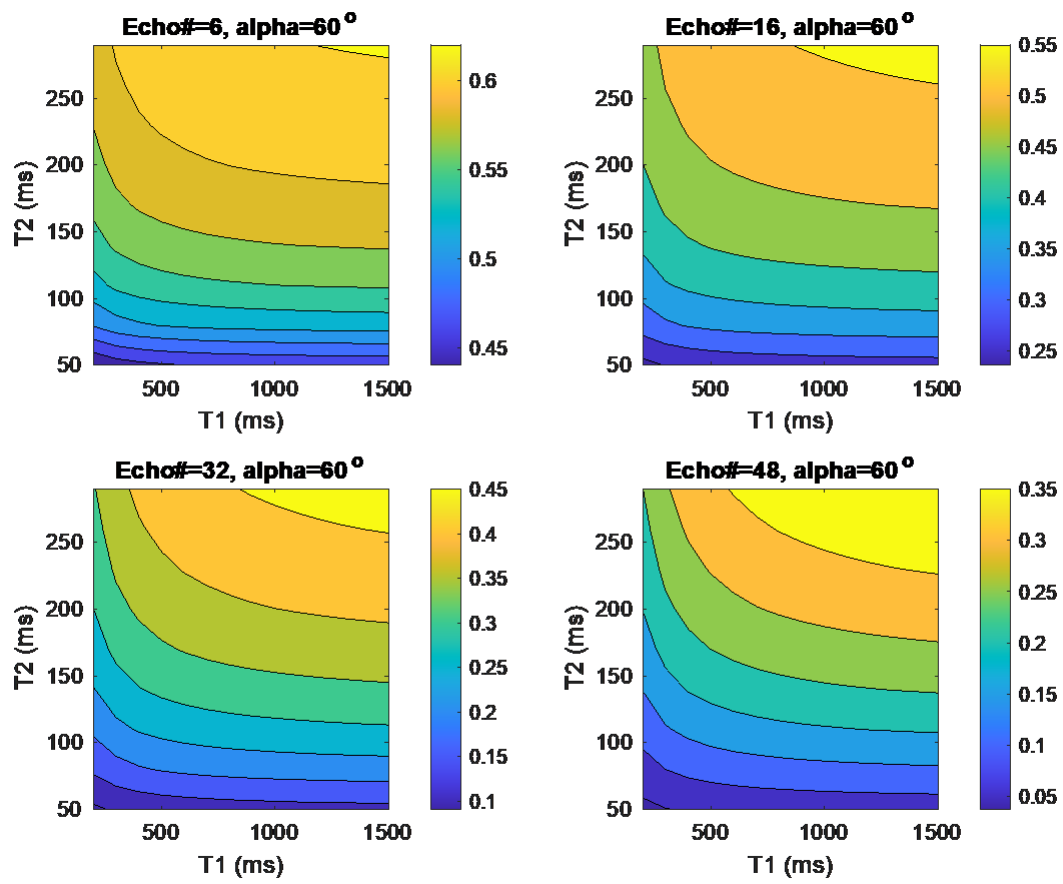






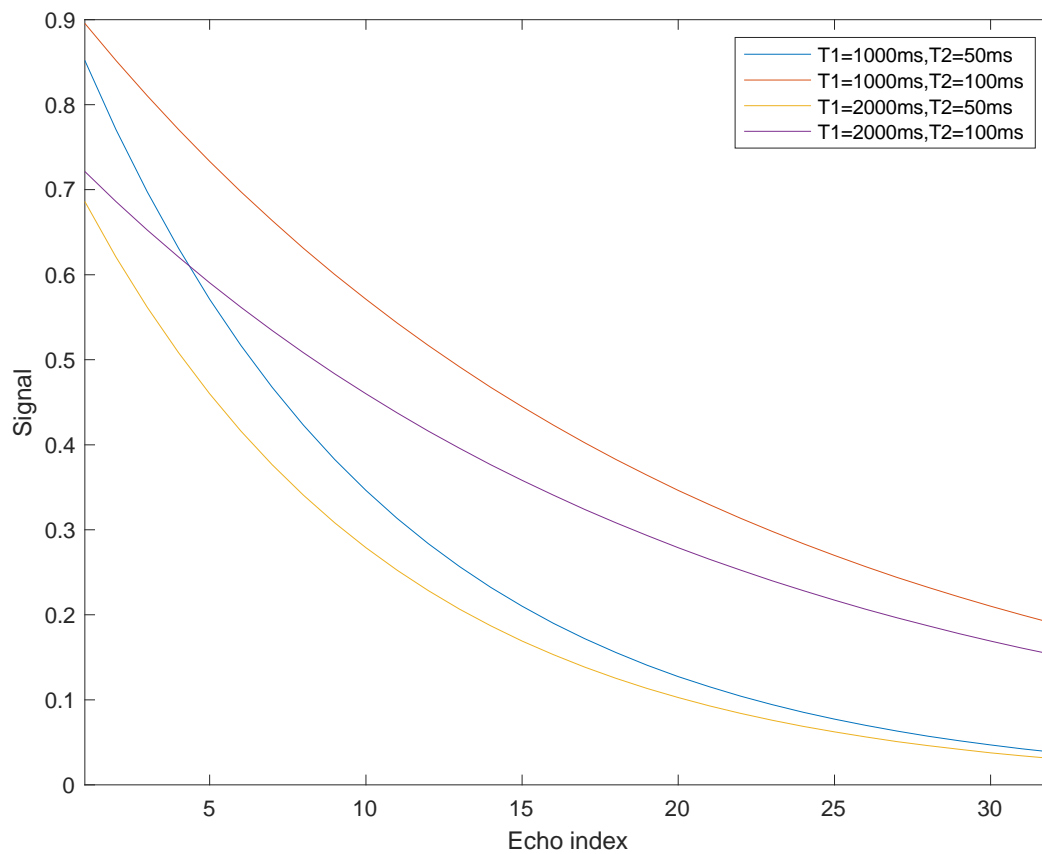






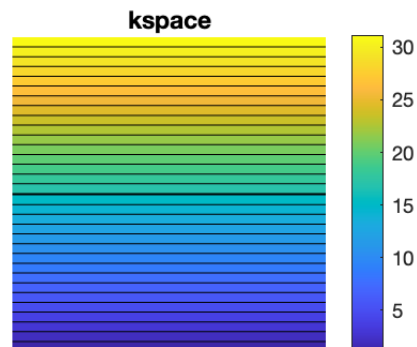
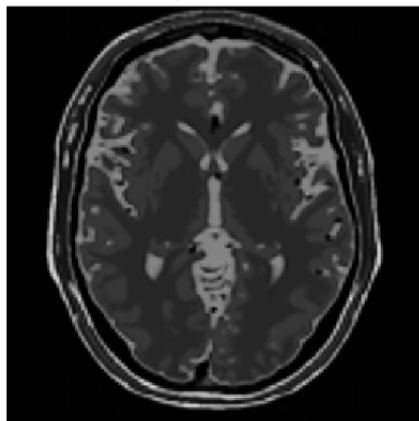
Problem 2

- Single-echo spin echo



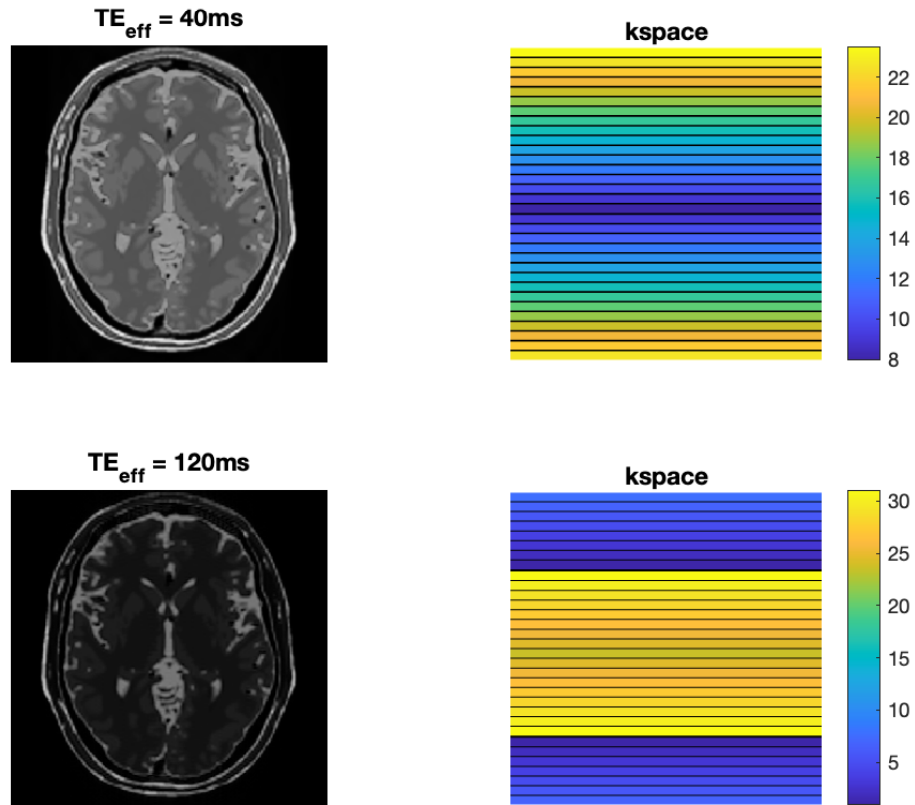
- Fast spin echo
 - Simulate 5 TRs
 - Simulate FSE to create image $TE_{eff}=80ms$
 - Echo #16 is sampled at the center of the kspace for its effective echo time. The total scan time for FSE should be $(3s)/32 \times 256 = 24 s$. For SE scan the time would be much longer ($3 \times 256 = 768s$).

$TE_{eff} = 80ms$



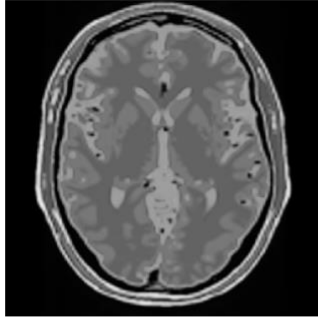
- Simulate FSE with $TE_{eff}=40ms$ and $120ms$

- For $TE_{eff}=40ms$, echo #8 is sampled at the center of the kspace.
- For $TE_{eff}=120ms$, echo #24 is sampled at the center of the kspace. The order of filling goes from the central line to the two sides. The colorbar shows the actual echo number that are used to fill the kspace.

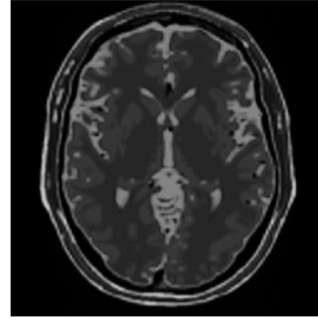


- Simulate FSE with $TE_{eff}=80ms$ but ETL=16, 32, 64, and 128
 - As the ETL gets longer for FSE, the signal intensity becomes worse as the lower frequency components are too far from the effective echo.

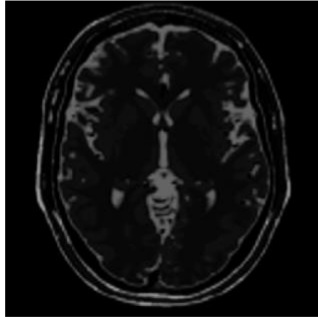
$TE_{eff} = 80ms, ETL=16$



$TE_{eff} = 80ms, ETL=32$



$TE_{eff} = 80ms, ETL=64$



$TE_{eff} = 80ms, ETL=128$

