

AbstractID: 3588 Title: An Improved Method for Susceptibility Correction of MR Spectroscopic Images

Purpose:

Multivoxel spectroscopic imaging usually requires a correction for magnetic field differences between voxels. The correction enables a narrower frequency range for integration to produce the metabolic image, increasing the signal to noise ratio of the image. One method employs a single reference peak common to spectra in all voxels, such as n-acetylaspartate, NAA. This works well in all but tumor cases where NAA is not present. A manual search must be done to find and correct the spectra in those voxels by referring to the creatine or choline peaks. This is rather tedious so a method of using multiple reference peaks was developed. If the pattern of the reference peaks is recognized, it can be used to correct for the magnetic field, automatically.

Method and Materials:

Data was acquired with the sequence from the NIH on 1.5T and 3T magnets from GE Healthcare. The sequence includes water saturation and outer volume suppression and allows for 4 slices to be acquired with a 32x32 matrix yielding a voxel size of 0.9 cc. The analysis was performed on Eigentool software with spectroscopy analysis code CSX. The reference peaks are defined by with a window and a maximum. The pattern of space between the reference peaks is compared to that of peaks larger than a second threshold. The pattern is allowed to shift up to one quarter of the span between the reference peaks.

Results:

The technique increases the speed of the analysis by decreasing the number of voxels that need to be checked manually from 100 or more to just the perimeter, perhaps 25, where the outer volume suppression may have missed some fat.

Conclusion:

Improving the analysis of MRSI can improve patient care by speeding up the time to report the results to the referring physician.