

Fast Contrast Enhanced Imaging with Projection Reconstruction

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The use of contrast agents has led to great advances in magnetic resonance angiography (MRA). Here we present the first application of projection reconstruction to contrast enhanced MRA. In this research the limited angle projection reconstruction (PR) trajectory is implemented to acquire higher spatial resolution images per unit time than with conventional Fourier transform (FT) imaging. It is well known that as the FOV is reduced in conventional spin warp imaging, higher resolution per unit time can be obtained, but aliasing may appear as a replication of outside material within the FOV. The limited angle PR acquisition also produces aliasing artifacts. This method produced artifacts which were unacceptable in X-ray CT but which appear to be tolerable in MR angiography. Resolution throughout the FOV is determined by the projection readout resolution and not by the number of projections. As the number of projections is reduced, the resolution is unchanged, but low intensity artifacts appear. This thesis presents the outcome of using limited angle PR for contrast enhanced angiography.