

Temporal Fidelity in MRI Time Series
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Unlike certain other medical imaging modalities in which all spatial frequencies of an image are built up simultaneously, in MRI the sampling of individual spatial frequencies is done serially. The impact of this in forming an image of a static object is negligible, as the resultant image resembles one in which all frequencies were measured at the same time. However, for a dynamic object the manner of spatial frequency sampling can have a major impact in how the temporal behavior of the object is portrayed in the resultant time series.

In this presentation the effects of various aspects of the MRI data acquisition on the portrayal of a dynamic object will be presented. The targeted application will be 3D contrast-enhanced MR angiography, a situation in which the distribution of contrast-material-enhanced blood is progressively visualized as it makes its way through first, the arterial and then, the venous vasculature within some 3D volume. Among the MRI parameters to be studied are the temporal ordering and potential relative increased rate of sampling of certain spatial frequencies, benefits of sharing spatial frequencies from one image to the next, and the benefits of parallel acquisition.