

Approaches to problems in high resolution *in vivo* spectral spatial imaging with radio-frequency EPRI

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Resolution in EPR imaging (EPRI) can have two meanings. Spatial resolution is the most obvious. This information derives from the data acquired with the highest gradients. However, EPRI provides spectroscopic information. For this information to be obtained from each image voxel, data must be acquired with lower gradients, spectral-spatial imaging. Spectral parameter resolution is the second meaning of resolution in the context of EPRI. Obtaining biologically relevant information requires a trade off between the two forms of resolution depending on the context. The width of the spectral line defines the level at which that trade-off will take place. Novel narrow line spin probes from Nycomed Innovations have improved this trade off by at least one order of magnitude. We present preliminary data suggesting that high resolution in both spatial and spectral parameter definition can be obtained with radiofrequency EPRI. Phantom measurements indicated sub-millimeter spatial resolution and sub-milligauss linewidth resolutions can be expected from images with this compound.