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S E M I N A R

Room 223B ZEC

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PARALLEL MR IMAGING: SYSTEM DESIGN AND LIMITATIONS

by

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Abstract: Parallel MR imaging reduces the time required to form an MR image by replacing conventional magnetic field gradient based spatial encoding with information extracted from the simultaneous use of multiple detector coils.

Parallel imaging with relatively low acceleration factors (two to three) has become commonplace in clinical MRI. The advent of high-field MR systems at 3T and even 7T will both enable and drive the use of parallel imaging techniques at much higher acceleration factors. Of interest now are the practical limits to parallel imaging. Factors limiting the use of high acceleration factors include the available number of independent receiver channels, the unavoidable decrease in signal-to-noise ratio with higher acceleration factors, and the high data rates that result. This paper will discuss system design for parallel imaging, including prototype 64 channel MR receivers and 64 element RF coil arrays. These systems have enabled single echo acquisition (SEA) MR imaging. Parallel imaging applications during transmit have also been suggested, and new techniques for implementing independent transmit chains will also be discussed.

Steve Wright received his Ph.D. from University of Illinois, 1984. Areas of interest are: magnetic resonance imaging, antenna theory and electromagnetics.

