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## **MR Imaging with Radiofrequency Phase Gradients**

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Although MRI offers highly diagnostic medical imagery, patient access to this modality worldwide is very limited when compared with X-ray or ultrasound. One reason for this is the expense and complexity of the equipment used to generate the switched magnetic fields necessary for MRI encoding. These field gradients are also responsible for intense acoustic noise and have the potential to induce nerve stimulation. We present results with a new MRI encoding principle which operates entirely without the use of conventional B<sub>0</sub> field gradients. This new approach – ‘Transmit Array Spatial Encoding’ (TRASE) – uses only the resonant radiofrequency (RF) field to produce Fourier spatial encoding equivalent to conventional MRI. High-resolution two-dimensional-encoded in vivo MR images of hand and wrist have been obtained at 0.2 T. TRASE exploits RF field phase gradients, and offers the possibility of very low-cost diagnostics and novel experiments exploiting unique capabilities, such as imaging without disturbance of the main B<sub>0</sub> magnetic field.

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