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Developing technology for MRI guided high-intensity focused ultrasound

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Focused ultrasound has the potential to deliver large amounts of energy to tissues deep within the body while sparing superficial tissues. MRI has the ability to acquire 3D images of tissues within the body with exquisite detail. MRI is also able to measure temperature changes in most tissue except bone and fat. At the University of Utah, we are developing an MRgHIFU system for treating breast cancer and are investigating methods for treating the brain through the intact skull. Both projects have interesting physics challenges, including measuring temperature in fat in the breast and focusing the ultrasound through the skull for applications to the brain.