Transcranial magnetic resonance-guided focused ultrasound, is increasingly used to non-invasively treat a wide variety of neurological disorders including essential tremors, Parkinson disease and neuropathic pain. Although this treatment is an MRI-guided procedure, the current pre-treatment screening and planning involve a CT of the head to obtain three-dimensional skull images. These images are necessary for estimating the proportion of absorbed energy and the acoustic phase shift associated with the skull and determining the transmit energy of ultrasonic wave to create thermal lesions at a desired focal spot. Ultrashort Echo Time MRI sequences are able to capture signals from tissues such as bone which has a very short transverse relaxation time [1].

1)
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