AbstractID: 8843 Title: Calculation Of Transverse Nuclear Magnetic Resonance Relaxation Times Using The Two-Point Method: A Comparison Of Results With Hahn Spin-Echo, Double-Echo, And Turbo Spin-Echo Pulse Sequences

Quantitative analysis of the transverse relaxation time (T2) distribution in magnetic resonance imaging has many important applications in the clinical setting; these include the accurate localization of neoplasms in the body and the determination of radiation dose distributions from polymer gels. There are many proposed methods for the determination of T2 values. All methods involve sampling at several points in time to determine the evolution of the signal in each pixel and fitting data to an exponential decay curve. The characteristic relaxation time for this curve is the value of T2 for the pixel. The accurate determination of T2 values is confounded by a spatially varying RF field, which causes unexpected variations in the nominal flip angle throughout the image matrix. A uniform polymer gel phantom was used to test three different pulse sequences: the Hahn spin-echo (SE), the double-echo, and the turbo spin-echo (TSE). Scanning was accomplished with a 1.5 T Siemens MRI unit. In each case, the two-point method was utilized to calculate a T2 map. As the phantom was uniform by design, the more uniform the resulting calculated T2 map, the less the analysis was affected by any non-uniformity of the RF field. Of the three pulse sequences tested, the Hahn spin-echo produced the most uniform T2 distribution. This is a consequence of the fact that in this sequence, there is a single RF pulse during each repetition, and the flip angle variation is reproduced when the echo time is varied for the second acquisition.