عنوان مقاله:

Numerical Solutions to the Bloch-McConnell Equations with Radio Frequency Irradiation Scheme for CEST MRI

محل انتشار:

بیستمین کنفرانس مهندسی برق ایران (سال: 1391)

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خلاصه مقاله:

Chemical exchange saturation transfer (CEST) is a new mechanism of contrast generation in magnetic resonance imaging (MRI) which differentiates moleculebiomarkers via chemical shift. CEST MRI contrast mechanism is complex and depends on radio frequency (RF) pulses used in experimental conditions. To find the optimalRF pulse, numerical solutions of Bloch-McConnell equations may be used. The purpose of this work is tocompare the effects of different RF pulses on the CEST phenomenon. First, a two-pool exchange model for CEST in MRI is used. Z-spectra and signal calculations for the twopoolmodel have been carried out for some RF pulses. Efficiency of both continuous and binomial RF pulses isinvestigated by calculating three parameters, namely: CEST image contrast, flip angle and specific absorption ratio (SAR). The contrast f CEST image is considered proportional to amount of saturation. As a binomial RF pulse, WALTZ-16* demonstrates a good efficiency, but generates some unwanted direct saturations. On the other hand, continuous RF pulses do not create any unwanted direct saturation, but have less efficiency

کلمات کلیدی:

Bloch equations, Bloch-McConnell equations, CEST MRI, Numerical solution, SAR

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