

Abstract Submitted
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New formulation of Magnetization Equation for Flowing Nuclear Spin under NMR/MRI Excitation(I) DILIP DE, MOSES EMETERE, VICTOR OMOTOSHO, Covenant University — We have obtained for the first time from the Bloch NMR equations the correct dependence of the single component of magnetization, M_y and M_z at resonance (NMR/MRI) on relaxation times, rf B_1 field (pulsed or continuous), blood(nuclear spin) flow velocity, etc. in the rotating frame of reference. The equations are applicable for both CW and pulsed NMR experiments with or without flow of spins. Our approaches can be extended easily to include gradient fields and diffusion of spins, if needed in NMR/MRI experiments. We also discuss the application of our equations to a specific case of MR excitation scheme: Free induction decay. The first time new equations of single component of MR magnetization and further equations that can be derived with the methodologies used here, can be applied towards accurate simulation of MR images/signals and extraction of parameters of clinical importance through comparison of the measured and the simulated images/signals.

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