NMR/MRI blood flow magnetization equation in the rotating frame of reference- Part I DILIP DE[1], Kaduna State University, Kaduna, Kaduna State, Nigeria — This paper describes thoroughly the need and the method of deriving the first of its kind the NMR/MRI blood flow magnetization (y component) equation in the rotating frame when rf B_1 field is applied along laboratory X direction. The equation is expected to serve as the mother equation for accurate non invasive blood flow quantification through all NMR/MRI experiments. It is shown how Awojyogbe's equation of blood flow magnetization can be obtained from above equation under assumption of constant B_1 field and $v_y = 0$. The method of deriving the equation can be applied to modify Bloch Torey Diffusion MRI equation to include relaxation times and flow and also to derive the NMR/MRI spin flow magnetization equation in the laboratory frame of reference. The derivation of the corresponding flow equation for longitudinal component of magnetization will be discussed in a separate paper.

[1]The research is in the area of application of NMR/MRI for noninvasive blood flow estimation

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