Some simulation tools for fast field-cycling NMR and MRI instruments

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Conventional NMR and MRI instruments operating at a fixed magnetic field have been enhanced for several decades by generations of skilled physicists and engineers who have worked out their optimal operating conditions. Fast field-cycling (FFC) instruments are not so advanced despite their continuous technical improvements since the beginning of their marketing or pioneer developement [1,2]. Here, we present some simulation tools which aim at reproducing the operating conditions of FFC-NMR relaxometers and FFC-MRI imagers in order to determine the instrumental defects, and more generally the unwanted magnetic field perturbations, which can be corrected by post-processing and those which lead to a definitive degradation of the free induction decay and have to be suppressed. Particular attention is given to the time stability of the magnetic field.

References:

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