

Should we care about imperfect pulses?

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Pulse sequences in solid-state NMR are usually designed and simulated using the assumption of perfect rectangular or shaped pulses. Since the early 50s it had been recognized that the limited bandwidth of the resonance circuit leads to pulse transients (amplitude and phase) at discontinuities of the phase or amplitude. Therefore, the rotations that the spins experience are not the same as the programmed ones. Transient compensation based on linear response theory allow the generation of pulses with a well defined rotation axis over the complete pulse. We have investigated which pulse sequences benefit from transient-compensated pulses and which sequences are insensitive to pulse errors generated by transients. Experimental results can be understood using theoretical models based on Floquet theory.

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