Title:	Analytic Theory of Time-Propagators in the Strong Coupling Regime
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Abstract:	NMR methodology concerns about tuning the behaviour of a spin system (considering the effects of local interactions) for achieving a desired pulsed sequence. In order to do so, it is imperative to have a complete understanding about the dynamics of the spin sys- tem (based on the principles of quantum mechanics). In general, its become difficult to formulate an analytic description of the time evolution of a spin system due to the time dependency of the Hamiltonian. The current study discusses the efficacy of an averaging scheme in deriving the time propagators (of a time dependent Hamiltionian). At first, an ideal two state spin system is considered and an analytic description of the spin system is proposed which concerns about the time evolution of the system. The primary focus of the study is to observe the effect of amplitude of the driving field on time evolu- tion of the system. Owing to the complicacies (time dependency) of the Hamiltonian, the corresponding time propagators are derived using an averaging scheme (Floquet Magnus Expansion). After probing the efficiency of the said averaging scheme the Hamiltonian of a periodically driven (say rotating solid) system commonly encountered in NMR spec- troscopy is discussed.
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