

Physics

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Recent development of spin dynamics in solid-state nuclear magnetic resonance

Eugene Stephane Mananga^{1,2}¹The City University of New York, USA²New York University, USA

The topic of spin dynamics in solid-state nuclear magnetic resonance opens a way to an infinite number of suggestions. In this abstract, we present the power and the salient features of the promising theoretical approach called Floquet–Magnus expansion that is helpful to describe the time evolution of the spin system at all times in nuclear magnetic resonance. Interesting applications of the Floquet–Magnus expansion approaches are illustrated by simple solid-state NMR experiments. However, it is very important to remember that the method of Floquet-Magnus expansion had recently found new major areas of applications such as topological materials. Researchers, dealing with those new applications, are not usually acquainted with the achievements of the magnetic resonance theory, where those methods were developed more than thirty years ago. They repeat the same mistakes that were made when the methods of spin dynamics and thermodynamics were developed in the past. This presentation is very useful not only for the NMR and physics communities but for the new communities in several younger fields. Solid-state NMR is definitely a timely topic or area of research, and not many papers on the theory of spin dynamics are available in the literature of NMR.

Biography

Eugene Stephane Mananga is a Faculty Member in the Physics Doctorate Program at the Graduate Center of the City University of New York, an Assistant Professor of Physics and Nuclear Medicine at BCC of CUNY, and an Adjunct Professor of Applied Physics at New York University. He completed his PH.D in Physics from the Graduate Center of the City University of New York, and holds 6 additional graduate degrees and training from various institutions including Harvard Medical School, Massachusetts General Hospital, and City College of New York. Eugene did his postdoctoral studies in the National High Magnetic Field Laboratory of USA, Harvard Medical School, and Massachusetts General Hospital. He was an “Ingenieur de Recherche” in the French Atomic Energy Commission and Alternative Energies (CEA-SACLAY-NEUROSPIN). Eugene has published more than 30 articles mainly as first author in major peer-review journals and has been serving as an editorial board member of several journals.

emananga@gradcenter.cuny.edu

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