Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Students' Annual Seminar

Testing limits of homonuclear decoupling at fast MAS

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Proton is a preferred nucleus for detection, due to its higher gyromagnetic ratio. ^{1}H-^{1}H dipolar couplings are very strong due to the same reason. This homogeneous interaction is difficult to average out just by magic-angle-spinning (MAS). It causes broad peaks and reduced coherence lifetimes, even under very fast MAS frequencies (>60 kHz). A combination of fast MAS and pulsed homonuclear decoupling sequences can extend ^{1}H coherence times to values higher than those possible with only one of these techniques. However, it is unclear if these two techniques can be combined to give an additive effect, especially at these fast MAS frequencies. I will discuss Phase Modulated Lee-Goldburg (PMLG) and TIlted Magic-Echo Sandwich with zero degree sandwich pulse (TIMES0) schemes for ^{1}H-^{1}H homonuclear decoupling which we have used to enhance the coherence lifetimes of protons in a uniformly labelled model peptide using both windowed and non-windowed schemes. We will suggest regimes in which these sequences can be applied to extend ^{1}H coherence times by a factor of 2-3 over MAS alone, making the use of sequences such as INEPT feasible in non-deuterated proteins.

Monday, Apr 17th 2023

1:30 PM (Tea / Coffee 1.15 PM)

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