

Magn. Reson. Discuss., referee comment RC2
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Comment on mr-2021-31

Anonymous Referee #2

Referee comment on "Heteronuclear and homonuclear radio-frequency-driven recoupling" by Evgeny Nimerovsky et al., Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2021-31-RC2>, 2021

This is an interesting and potentially important manuscript, demonstrating the utility of simultaneous RFDR π pulse trains on ^{15}N and ^1H as a means of transferring polarization from ^{15}N to ^1H and also transferring polarization among ^1H spins. The authors show that long-range ^1H - ^1H transfers are observed, which provide useful structural information. With numerical simulations, they explore dependences on resonance offsets that are important especially at lower MAS frequencies.

This paper is certainly suitable for publication in MR. My only recommendation is that the authors re-examine their choice of references in the Introduction. It is worth noting that the first examples of homonuclear dipolar recoupling (by Meier and Earl for ^1H - ^1H couplings and by Tycko and Dabbagh for ^{13}C - ^{13}C couplings and quantitative distance measurements) are not cited. The Ok paper is not about RFDR. What is now called RFDR was originally introduced by Gullion and Vega (and called SEDRA). The 2001 paper by Ishii analyzed finite-pulse effects in detail and showed that XY4 phase cycling produces an average homonuclear dipole-dipole Hamiltonian with the same operator form as in a non-spinning sample.