

Magn. Reson. Discuss., chief editor comment CEC1
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Comment on mr-2020-38

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Chief editor comment on "Protein dynamics insights from 15N-1H HSQC" by Erik R. P. Zuiderweg, Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2020-38-CEC1>, 2021

It seems to me that this discussion deserves more careful consideration.

"as far as I can see, Abragam actually never defines what limits there are what one may call "like" spins."

Abragam's book, page 290: if the spins I and S are like spins, only the sum $\langle I \rangle + \langle S \rangle$ is observed, whereas $\langle I \rangle$ and $\langle S \rangle$ are observed separately if the spins are unlike.

Following this definition, the resonances of amide protons in liquids are observed separately (their resonances usually don't overlap), which makes them unlike spins. Of course, the situation is different in solids.

"I disagree with esteemed Prof. Axel Bothner-By"

To the best of my knowledge, the theory underpinning ROESY has not been questioned previously.

Regarding the discussion of the PEP scheme, more detail would be welcome: for a two-spin system, the PEP scheme transfers every term present at the end of the evolution time t_1 into a term that is observable during acquisition (i.e. t_2). Not all of these terms relax as transverse proton magnetization during both the delays $b - c$ and $d - e$. For example, transverse relaxation tends to be much slower for ^{15}N than ^1H .