

## ***Interactive comment on “Representation of population exchange at level anti-crossings” by Bogdan A. Rodin and Konstantin L. Ivanov***

**Anonymous Referee #2**

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This manuscript elegantly treat the LAC phenomena in magnetic resonance and outlines several cases where these could be of use. This will be an extremely useful article for the understanding of LAC and related aspects and making use of them in fields like PHIP and/or singlet state NMR.

I have a few minor comments:

\*The ket notation looks like a curved bracket in many of the equations. This is confusing.

\*Can the authors justify the form of the  $\Pi$  operator in Eq. 14?

\*The use of superoperators is also a bit confusing. For instance, in Eq. 18, the superoperator acts on state kets and not operators.

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\*Can the authors say in which cases the basis rotation is equivalent to a physical rotation of spins in the 3D space.

\*Can MAS be included in the arguments given here?

I recommend publication of this manuscript with minor revisions, as noted above, if required.

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