

## ***Interactive comment on “Revisiting paramagnetic relaxation enhancements in slowly rotating systems: how long is the long range?” by Giovanni Bellomo et al.***

**Giovanni Bellomo et al.**

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Thank you for your constructive comments and suggestions.

- Line 37: There were a number of groups who examined multiple-spin effects on cross-relaxation rates using a complete rate matrix at the same time as Borgias and James, 1989. It would be nice to reference some of the other papers as well (e.g. Boelens and Kaptein, J Mag Res 1989; Olejniczak and Fesik J Mag Res 1986; co-workers and Gorenstein JACS 1990).

These references have been added as suggested.

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- Line 55 and elsewhere: The use of “the CORMA approach” sounds like the approach is unique to the CORMA program, but that is somewhat misleading as other programs from other research groups utilize a complete relaxation rate-matrix approach. A more accurate phrase would be “the CORMA program” or “the complete rate-matrix approach.”

The expression has been changed as suggested (complete relaxation rate-matrix approach)

- Eq 1: I could not see the definition for  $\sigma$  in the main text. Although the definition does appear in the supplement, it should appear with equation 1.

$\rho$  and  $\sigma$  are now defined immediately after Eq. 1.

- Figure 1 and the description lines 92-100: The authors compare in fig 1a and 1c the apparent rates that would result from analyzing  $M'(t)$  in comparison to the actual Solomon relaxation rate, eqn 2. It would be helpful for the reader to articulate in the figures and text “apparent relaxation rate” or somehow differentiate a rate estimated from  $M'(t)$  versus the actual rates that appear in the rate matrix, eqn 1.

The expression “apparent relaxation rates” is now defined and used in the text and in the caption of Fig. 1.

- line 91: it is mentioned that Led and coworkers reported deviations in distances determined from analysis of experimental magnetization decay. Can the authors make a direct comparison of the computed results (fig 1) with the experimental data? For example, the theoretical back-calculated distances in 1b with the experimental distances calculated from the experimental longitudinal relaxation rates?

As suggested, we have now included in Fig. 1B the distances back calculated from the experimental rates collected by Led and coworkers for a direct comparison with computed data.

Typographical corrections:

- line 96: “Analogous behaviors are” should be “Analogous behavior is”

-line 98: “differ of orders” should be “differ by orders”

-line 170: “This occurs” is missing a subject noun. Perhaps “This contribution occurs” or “This transfer occurs”

Corrected, thank you!

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Interactive comment on Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2020-33>, 2020.

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