

Magn. Reson. Discuss., author comment AC4  
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## Reply on AC2

Günter Hempel et al.

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Author comment on "Efficient polynomial analysis of magic-angle spinning sidebands and application to order parameter determination in anisotropic samples" by Günter Hempel et al., Magn. Reson. Discuss., <https://doi.org/10.5194/mr-2021-39-AC4>, 2021

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We thank Anonymous Referee #1 for comments which opens the opportunity to improve the way of explaining our results and to remove some errors from the first version of our manuscript. Here the replies to the remarks / comments/ questions:

Comment 1: Even though the samples and experimental conditions are not the major concern of the study, and the information is given somewhere in the manuscript, it is still easier to read if summarized in a dedicated section.

Response: In the revised version an paragraph "Experimental" will be added.

Comment: In line 487 reads "The second to last column in Table 3 is the noise-related sum squared uncertainty of 10 SSB intensities considered" and in Table 3 the 2nd last column is  $10\Delta I^2$ . Does this supposed to mean 10-time the integration uncertainty of some sort of "average SSB", assuming each SSB has similar line width?

Response: In fact, we assumed and observed that all SSB of one species have almost equal line width. (The factor 10 arises from the  $\chi^2$  procedure: We sum up over the mean-square differences between experimental data and polynomial values for both  $C_{-2}$  to  $C_2$  and  $S_{-2}$  to  $S_2$  (10 instances). The resulting  $\chi^2$  is then compared with the summed squaric uncertainties of the experimental data.) Therefore we will add this explanation to the related paragraph.

Comment: Following #2 in line 488 reads "Only for the  $C_1+C_2+C_5$  combined signal does  $\chi^2$  from the best fit exceed this value significantly". From Table 3,  $\chi^2$  of  $C_3$  and  $C_4$  is even bigger compared to the uncertainty, as discussed in the later section. Did I misunderstand something?

Response: This were typing errors. In fact, the  $\chi^2$  values for  $C_3$  and  $C_4$  must have the exponents -6 (instead of -5 as displayed in the table.) This will be corrected in the revised version.

Comment: Besides, there are a few typos to be corrected:

1. Line 36, "different order are separated"
2. In Fig. 2 caption, should be "for  $\eta=1$ " instead of "for  $q=1$ "
3. Line 389, "the intensity of this valuable signal"

4. In eqn. 40, a missing second half parentheses after  $\omega^2$ .

Response: The typos will be removed in the revised version.