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Memorandum

To: Dr. Alberto Guadagnini, Editor of Hydrology and Earth System Sciences

Subject: Revision of Paper # hess-2022-372

Dear Editor:

Upon the recommendation, we have carefully revised Paper # hess-2022-372 entitled "A General Model of Radial Dispersion with Wellbore Mixing and Skin Effects" after considering all the comments made by the reviewers. The following is the point-point response to all the comments.

Response to Reviewer #1:

The model of radial dispersion presented in the manuscript is governed by a system of coupled equations with constant coefficients. This system has a straightforward analytical solution in Laplace space, presented by the authors in Supplementary Materials. The main achievement of the model could be its practical feasibility, which requires the computation of the inverse Laplace transform of the solution and an optimization procedure to fit the analytical solution and the experimental data. Unfortunately, these two parts of the model are still missing in the revised manuscript.

[Reply: Thanks a lot. We have carefully revised Paper # hess-2022-372.](#)

In my previous review, I recommended that the authors provide sufficient details in the Supplementary Materials or, if this is the case, references for THE METHOD AND THE SOFTWARE used, for both the computation of the inverse Laplace transform and the genetic algorithm employed in the optimization procedure. Instead, in their reply the authors enumerate several references, without pointing out a method and a software they have used. The absence of these precise details, which allow the reproducibility of the results, leads to a lack of trust in the modeling approach presented in the manuscript. Therefore, I reiterate the recommendation that the authors provide these essential details that can make their work useful to potentially interested readers.

[Reply: Implemented. De Hoog method and GA software and methods have been added. Please see Lines 287-289 and 444-446.](#)

Response to Reviewer #2:

The authors answered my concerns in a satisfactory way. The paper is clearer and has the right context with respect to other available models. I would love to see the error incorporated in the figure and not just in the legend but this is a minor thing and I leave it to the editor decision.

[Reply: Thanks a lot. The errors have been added to Figures 2 and 3. Please see Figures 2 and 3.](#)

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35 If you have any further questions about this revision, please contact me.

36 Sincerely Yours,

37 Quanrong Wang, PhD, PG.

38 Professor and

39 Holder of Endowed CUG Scholar in Hydrogeology

A handwritten signature in black ink, reading "Quanrong Wang". The signature is written in a cursive, flowing style with a large initial 'Q' and 'W'.