This paper first lays a brief theoretical framework around regularization, SMPS inversion, and TDMA inversion. The theory surrounding SMPS and TDMA inversion is framed within the developed Julia software environment and not within the traditional DMA/TDMA inversion. However, the author does reference the 2018 paper (first version of this software) which does translate the software framing into the traditional SMPS/TDMA framework. Readers new to this subject will likely need to use the 2018 paper to digest the results as mentioned at the end of the introduction. I was able to do so without issue.

During the theoretical explanation, the author documents the differences between the 2018 edition and this new edition. These changes in TDMA inversion are positive and highlight our current understanding of multicharged behavior. As such, this routine represents a full multi-charge inversion in TDMAs as we currently understand it. Additionally, different regularization techniques are now a part of this software package. These two changes are a marked improvement over existing inversion methods which restrict inversion to a single method or neglect multicharged particles.

The paper then proceeds to test different regularization methods on large data sets, which at this point, is of great value to the community and to me. Comparison of different regularization methods is of great interest, and I suspect I will read the final version several times to digest the results of this study. After reading, I have no major issue with the revision.

I have a few comments and questions as documented below.

Line 26: I understand “mixing state” to be internal, external, or a combination of the two. The mentioned variables do not fully define my understanding of mixing state. Maybe a sentence or two clarifying this statement is needed.

Line 61: I am not crazy about the use of the word “shape.” I may misunderstand the inversion, but many of these routines do not assume a “parameterized function”, however, they do assume a shape. (i.e., a series of rectangles or a series of trapezoids (lines))

Line 111: Is this suppose to begin a new paragraph???

Line 144: I do not understand where the 8 combinations come from. Is it omission or presence of D and B along with two algorithms?

Line 159: I may be a little confused. Does this mean that only the initial guess is bounded?

Line 169: Is the initial guess also the a-priori estimate? If so, the words “initial guess” seem inappropriate. When I see “initial guess”, I assume these are the beginning values for x. However, equation 5 states that x_0 is not an “initial guess.” Is x_0 both an initial guess and the estimate?

Line 276: there appears to be a Zs (or other variable) missing in the sentence.

Equation 11: I do not see how this yields an array. Based on the previous example for mapfoldl, I assume that the output is a sum (the variable a) as you have previously defined. Is the sum (or subtraction) only

an example and replacement of – with vcat changes the output from a progressing sum to a concatenating array? If so, can we change the writing in the example to say that the sum is an example.

Line 295: I think the word “exiting” should be “entering.”

Lines 295 through 303: A gentle reminder to the reader regarding the meaning of the dot (·) between growth factor and the product of T and the inlet size distribution. For a long while, I thought you were converting the size distribution into another form. Only after some extended study did I realize that g_0 was applied only to diameter.

Line 337: you state that the mobility grid for DMA 2 is $Z_{s,2}$. Do you mean this vector is the array of centroid mobilities for DMA2? Line 315 states that it is such. Is this variable supposed to be Z?

Line 351: is n the number of growth factor bins? This sentence may need rearrangement.

Line 360: Equation 18? Do you mean 17?

Line 380: Our TDMA does not normally geometrically step (although it can). Will that impact the use of this routine?

Line 390: Please choose how to denote the subscript for *D*. Because there is no way to show the superscript for e, confusion can ensue. The example on Line 151 does not use exponential form. It would be good if one form or the other is used throughout. I spent a good amount of time trying to figure out what “e” was. I had a long laugh when I did figure it out.

Line 552: I expected a more direct statement that summarized which inversion method was better for the dataset. From this I assume I should choose L_2B. Is this correct?

Line 628: Would prefer using the word function instead of shape as the inversion uses rectangles which is also a shape.