

**Review of article Scalar-potential mapping of the steady-state magnetosheath model
by Yasuhito Narita, Simon Toepfer, and Daniel Schmid**

I received the manuscript after it has gone through two iterations of the review and I believe the article is already in a good shape and describes a magnetosheath flow and magnetic field model which is relatively easy to implement and consistent with a range of empirical shock and magnetopause models. The mapping method is to a large extent analogous to earlier works, mapping the empirical magnetosheath geometry to an analytical model by Kobel and Fluckiger, but offers a likely improvement in model accuracy at the magnetosheath flanks and also allows an easy calculation of flow velocity and field geometry from the mapped potentials.

From this point of view, the article presents an improved method addressing a problem to which no standard solution currently exists, and thus shows potential for application in future studies.

I agree with one of the reviewers that it is hard to assess how useful the model is before it is compared to experimental data, but nevertheless, the article can be considered suitable for publication even in its present form, where only the method is presented, and the model can be tested by future studies, if considered useful. However, as a paper presenting a computational method, publishing the code along with the paper would be of a great benefit.

I have the following technical comments, which are mostly minor. If these are addressed, I believe the article can be published.

1) **Appendix** – the appendix is so short that I do not see a reason not to include the few lines in the text of the article. It would improve readability.

2) **Line 380, Code and data availability:** I believe the potential for future use of the model would be greatly enhanced by publishing the code for implementation of the potential mapping along with the article. This would allow others to build on this work more easily and to test it against spacecraft data.

The authors say “No codes or data are used in this work” which does not seem correct. The figures in the paper were certainly produced by a computer code implementing the mapping and in particular the code used to generate Figures 10, 11 and 12 would be a worthy and I would say almost mandatory attachment to this work.