

## ***Interactive comment on “Data assimilation using adaptive, non-conservative, moving mesh models” by Ali Aydoğdu et al.***

**Anonymous Referee #2**

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This paper made efforts to apply EnKF to a 1D model with a non-conservative moving mesh. Two fixed uniform reference meshes with different resolutions were adopted and compared. Details of the remapping process were shown clearly. Although the further application to the 2D sea-ice model with discontinuities seems to have many challenges, the preliminary attempt to the 1D model has achieved some novel progress. The paper itself is well organized. So I think this paper could be published after some minor revisions.

1. Page 4 Line 20 and Page 5 Line 25: Please explain clearly the novelty of the mesh remapping methodology in this paper compared to the procedure in Du et al. (2016). It seems that similar remeshing (non-conservative moving mesh) and EnKF data assimilation procedures are applied in the two papers.

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2. In Figure 3, please explain S1, S2 and S3 briefly, especially the mesh characteristics in the procedures.

3. Page 6 Line 3: Please add explanation of the Lagrangian and remeshing features of the neXtSIM's 1D mesh such as in section 1.3 briefly.

4. It's not so clear that if the parameters  $\delta_1$  and  $\delta_2$  are used both in one mesh or two meshes with different resolutions separately in section 3.1. In section 5.2, it seems the two parameters are for HR and LR separately. If so, why the ratio of the remeshing criteria is discussed in Page 17 Line 10?

5. More details of the EnKF data assimilation process in the numerical experiments should be declared, such as the DA time interval. Is it the same when using two different types of observations?

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