General Comments:

After the revision, the manuscript has resolved some of my concerns. However, I found some severe issues from the proposed dataset, which need to be addressed. A careful revision is still necessary.

1. Feedback towards the response letter

1) The authors emphasized that the proposed dataset aims to capture spatiotemporal trends national wide, and regional uncertainty analysis in Fig. 5, or temporal analysis requested from reviewer #2, are not focused. Site distribution could be a limitation but won't affect the analysis.

Can you provide temporal analysis at typical regions, and spatial uncertainty analysis (as in Fig. 5), by comparing the data with SMAP? Temporal variation comparison between regional averages of two datasets can prevent the 'cherry picking' and resolution mismatch issue. (Maybe more datasets are better, to see if this proposed data is not consistent with the majority.) Even though SMAP has a coarse resolution, it still has relatively good accuracy, spatiotemporal continuity, and reliability from passive microwave observations. If the study focuses on national scale analysis, coarse resolution won't be a problem.

What I would like to point out here is that, the advantage of a dataset with a high spatiotemporal resolution is to do regional analyses, not a national scale. Therefore, I would still recommend the authors provide such detailed regional and temporal assessment.

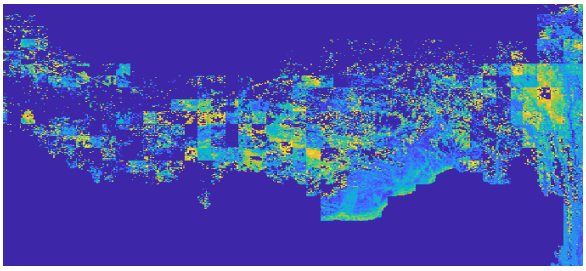
Additionally, considering that the model parameters are obtained mainly based on spatial information national wide, accuracy stability at the time dimension is very important.

2) SM and radiative temperature have strong interactions during the daytime due to ET and energy partitioning, unlike other "triangle method"-based studies, why does the proposed method only used nighttime LST, when the whole energy partitioning process is very weak? (even Fig. 2 of the response letter shows the daytime relationship between LST and vegetation cover)

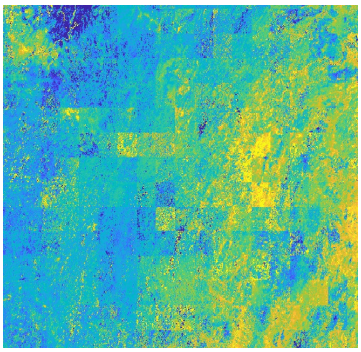
2. Issues with the data

After I downloaded the proposed dataset, I found several issues, especially focusing on regional levels, and that is why I start to suspect its ability to work on regional studies. Taking Day 2008053 as an example:

1) mosaic issue/spatial discontinuity

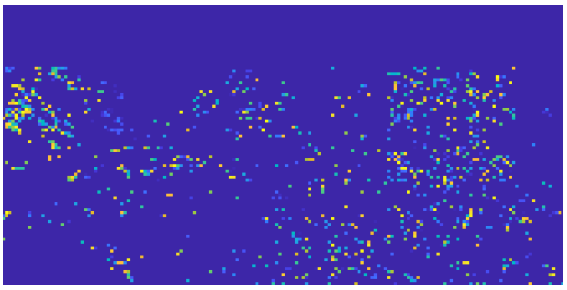


Clearly severe mosaic patterns are illustrated. Such an issue is also obvious in northeastern China on this day. In fact, I can find similar mosaic patterns in most images and places, such as a day (Day 2008210) with good spatial completeness at central south of China:



Pixels at connection regions among mosaics will have large uncertainties. Such mosaic issue is not reflected in Fig. 5. This problem should be focused on because it will affect the feasibility in regional studies.

2) Besides, there are lots of randomly scattered high SM values (case Day 2008053), which seems not correct in the dry region:



3) There are no coordinate, projection, or geolocation information in the dataset, causing it hard to be used. Moreover, I would like to recommend the authors include 'QC' band in the dataset in the future version, based on comprehensive uncertainty analysis and available input data.

Technical comments

1. Line 54: blank missing before '('