

Dear editor,

First, we would like to thank the four referees and the editor for dedicating their time to our manuscript and providing us with positive and constructive comments.

Our major revisions include the following points:

- **Scientific validation dataset:**

One of major issues of the original study was that the validation data were not temporally and spatially independent from the training data. Thus, available stations were randomly divided into two roughly equally sized parts: training stations and validation stations. The snow depth observations from training stations (342 sites) together with satellite T_B and other auxiliary data can be used to train the RF model. The measurements from validation stations (341 sites), as spatially independent data, can be applied to validate the fitted RF algorithm and reconstructed snow depth product.

- **Four combinations of predictor variables:**

The procedure described in the original manuscript was complicated due to so many predictor variables. Based on the correlations between the predictor variables and the variable importance metrics, we designed four schemes of predictor variables to train the RF model in the revised manuscript. The scheme one was the simplest and its predictor variables included satellite observations at 19 GHz and 37 GHz only. The scheme four was the most complicated. The predictor variables were satellites observations, latitude, longitude, elevation and land cover fraction. These four combinations of predictor variables, together with snow depth measurements, trained the four RF algorithms. We validated these four fitted RF algorithms to determine whether certain predictor variables are necessary and whether their inclusion affects the RF model.

- **Validation of the fitted RF algorithms:**

The fitted RF algorithm was validated using temporally independent data in the original manuscript. To assess the feasibility of RF model in estimating snow depth, we conducted three tests to verify the fitted RF algorithms in the revised manuscript. The same training samples (same algorithms) were used for three tests but with different validation datasets. In Test1, the validation data were from out-of-bag (OOB) samples. Generally, approximately two thirds of the samples (in-bag samples) were used to train the trees and the remaining one-third (OOB samples) were used to estimate how well the fitted RF algorithm performed. This preliminary assessment generally provides a simple way to adjust the parameters of the RF model. In Test2, we applied temporally independent reference data during the period 2015-2018 to assess the accuracy of the temporal prediction of fitted algorithms. In Test 3, a spatially independent dataset from validation stations during the period 2015-2018 was used to assess the accuracy of spatio-temporal prediction.

According to the validation of the fitted RF algorithms, we found many redundant inputs due to highly correlated predictor variables. Thus, we used a straightforward fitted RF algorithm (trained with T_B and geolocation) to retrieve a consistent 32-year daily snow depth dataset from 1987 to 2018.

- **Validation of the reconstructed snow depth product:**

This product was evaluated against the independent station observations during the period 1987-2018. We also compared the performances of snow depth product in three snow cover areas over China.

- **Trends analysis of snow depth:**

Three long-term (1987-2018) datasets, including ground truth observations, RF estimates and former snow depth product in China, were applied to analyze the trends of snow depth variation in China using the Mann-Kendall test and slope method.

- **Available long-term snow depth dataset:**

The reconstructed dataset from 1987 to 2018 is now available and we will upload the data later.

- **Rewritten, simplified and better structured:**

We revised the manuscript carefully and thoroughly to clarify the structure and content of the paper. We rewrote the results and discussion sections and split them. Additionally, a thorough revision of the manuscript was completed by a native speaker.

We have studied the comments carefully and have made corrections, which we hope will meet with approval.

We thank you for giving us the chance to revise the manuscript, and we look forward to hearing from you.

Jianwei Yang and Lingmei Jiang, on behalf of the authors