

This paper generates snow data derived from MODIS onboard TERRA and AQUA. The paper combines MODIS TERRA and AQUA satellites snow data to reduce uncertainty/bias. The paper uses state of the art technology to generate a new snow dataset for the High Mountain Asia covering the period from 2003 to 2018. The data generation is well presented and the method is stepwise explained. The output is a complete product showing any changes in the original snow product, which is very useful for users. The data has a wide range of applications including hydrology, climate change, hydro-glaciology, and modelling. I have few minor comments for the authors to address in order to improve the readability of the paper.

Response: We are thankful to the reviewer for the constructive review and comments. We carefully considers all the comments and revise the paper accordingly. Our point by point response is given in blue color whereas, the comments are in black.

1. As Per the definition, maximum snow product has the tendency to overestimate snow. If there is a short term snow cover in lower elevation where the snow is not stable over time, the maximum approach results in more snow than in reality. It is important to know why 8-day composite data is used and why the authors prefer this product than the daily products?

Response: We agree to the reviewer that the 8-day composite may overestimate snow. However, the main constrain in retrieving daily snow is the cloud cover. Even after using 8-day composite data (which is affected by clouds if it is persistent continuously for 8 consecutive days), there were clouds over 3.66% of the study area on average in the observation period. In addition, the large sensor azimuth angle (SZA) produce uncertainty (overestimation or underestimation) and makes the daily product significantly uncertain. We not only reduced the underestimation by removal of cloud cover but also reduced underestimation of uncaptured snow in one or more days of the 8 consecutive days and removed significantly large amount of overestimation (46% of the original snow) also caused by SZA.

2. There is a short temporal difference between both MODIS and Landsat, how did you manage to compare one single Landsat data set with an 8-day maximum composite and Why did you resample MODIS to Landsat-pixel size and not vice versa?

Response: We assume that the snow cover change is insignificant in each 8-days composite of MODIS. Although, the snow changes continuously but the snow cover variation is insignificant as compared to the uncertainty in snow extent from the large pixel size (500 m) of MODIS. We resampled MODIS to avoid data loss as resampling high spatial resolution to low resolution is susceptible to data loss because multiple pixels (consist of both snow and no snow) are converted to one pixel (either snow or no snow).

3. How many days temporal filter is applied in this study, it is unclear.

Response: Temporal filter considers two before and two after 8-days composite images for the cloudy pixels in the observed 8-day image, this means that for the cloudy pixels the longest days is 40.

4. Combining Aqua and Terra —> This might be correct. But the retrieval accuracy changes due to different illumination conditions between Terra and Aqua. It has to be shown in detail, that the snow product (daily basis) between Terra and Aqua is more or less identical. Especially in rough topography there is a difference between both snow products.

Response: We agree that the retrieval accuracy may change but this may affect daily snow retrieval. As we use 8-day composite, the accuracy of snow retrieval is significantly improved as we consider snow if both the products retrieve pixels as snow. We do not agree that the both Terra and Aqua be identical because the sensor zenith angle is the main factor to cause overestimation. Our results of 46% overestimation is a clear example of uncertainty in the rough topography for both the products.

5. Equations 4 and 5 seems identical, what exactly is the difference?

Response: These equations seem identical but are different. In equation 4, the pixels is snow if Terra is snow or cloud and Aqua is snow, WHEREAS, in equation 5, the pixels is snow if Aqua is snow or cloud and Terra is snow.