The data has been created by:
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File description

The submitted monthly SMB data of the Greenland and Antarctic Ice Sheet is based on a subsurface model, the setup for Greenland is described in Langen et al 2017, and the setup for Antarctica is described in Hansen et al 2021.
Both setups simulates SMB from January 1980 to December 2021, at the surface the subsurface model is forced with the regional climate model HIRHAM5, which is forced with reanalysis dataset ERA-interim from 1980 to 2018, and ERA5 from 2019 to 2021.

The data file (ASCII, comma separated) contains both Zwally and Rignot basins and 9 columns in the same format and structure specified on the IMBIE website:

(1) Participant Surname, (2) Experiment Group (altimetry/gravimetry/mass budget), (3) Drainage Region Set (Rignot/Zwally), (4) Drainage Region ID, (5) Drainage Region Area (km2), (6) Drainage Region Area Observed (km2), (7) Date (decimal years), (8) Relative Mass Change (Gt), (9) Relative Mass Change Uncertainty (Gt)

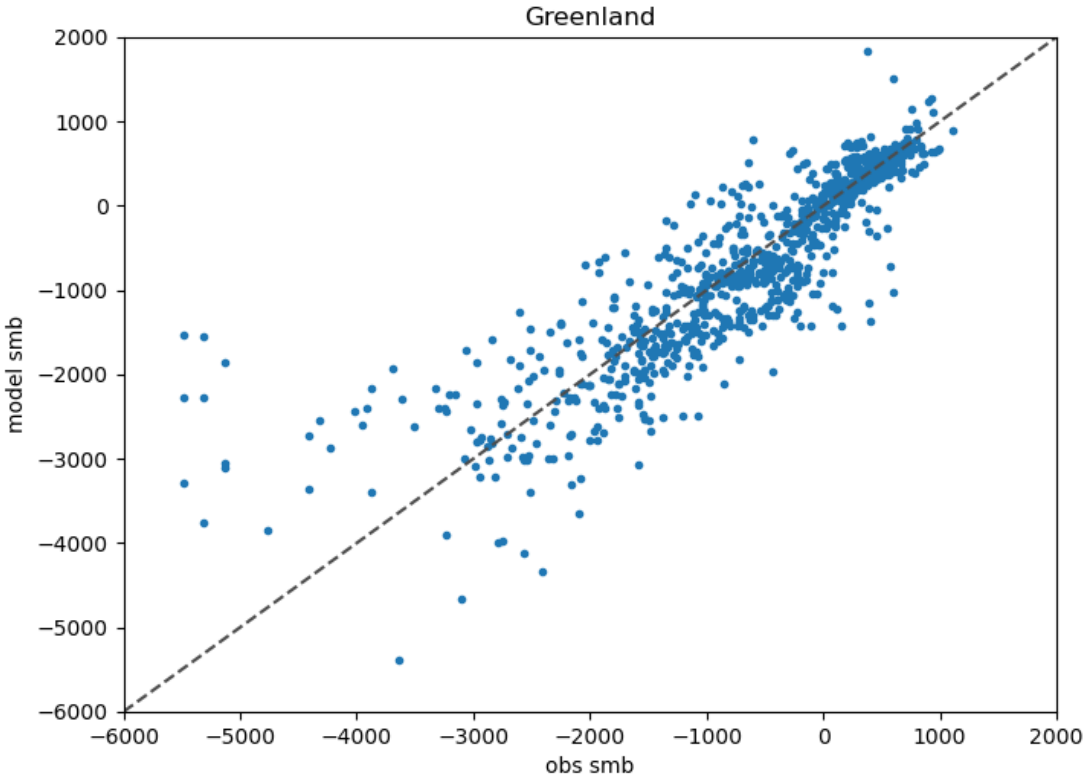
Furthermore, in the end of the file are the ice sheet wide sums denoted AIS and GRIS.

Data uncertainty calculation method

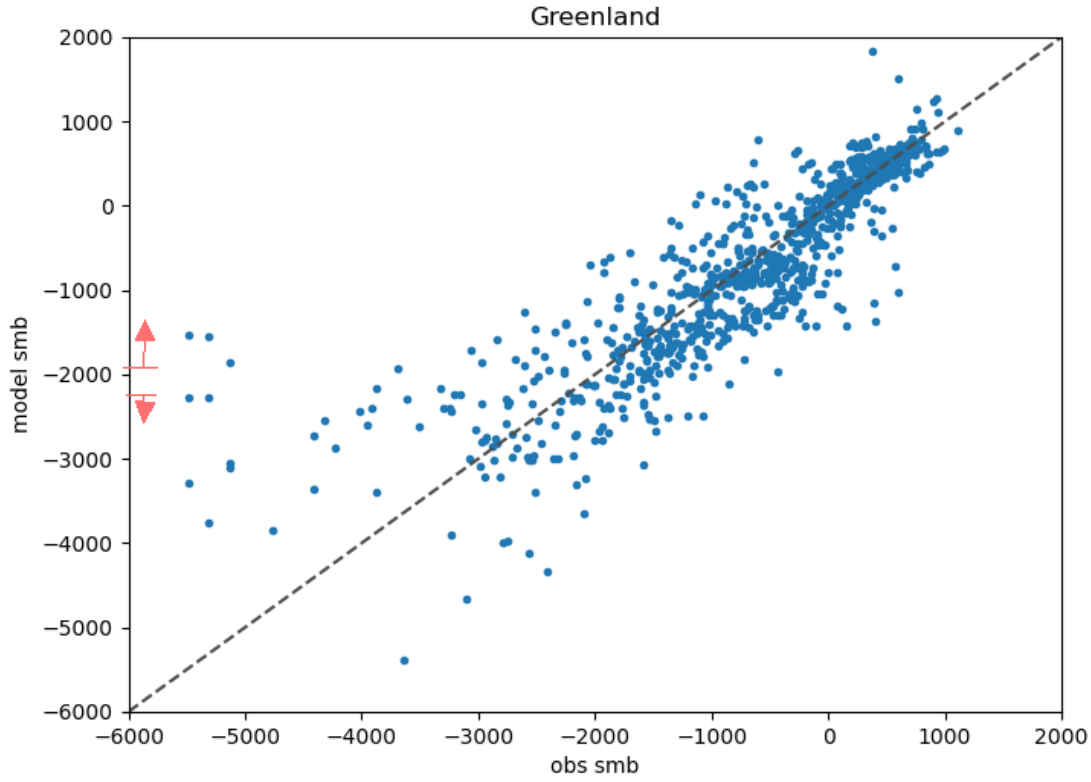
The uncertainty calculation method is coordinated with Xavier Fettweis (MAR) to promote comparable uncertainty ranges.

Overall, the SMB error is estimated from an error function that is computed from a piecewise linear fit estimated of the 80 percent best matching root-mean-square error (RMSE) of a model-observation comparison.

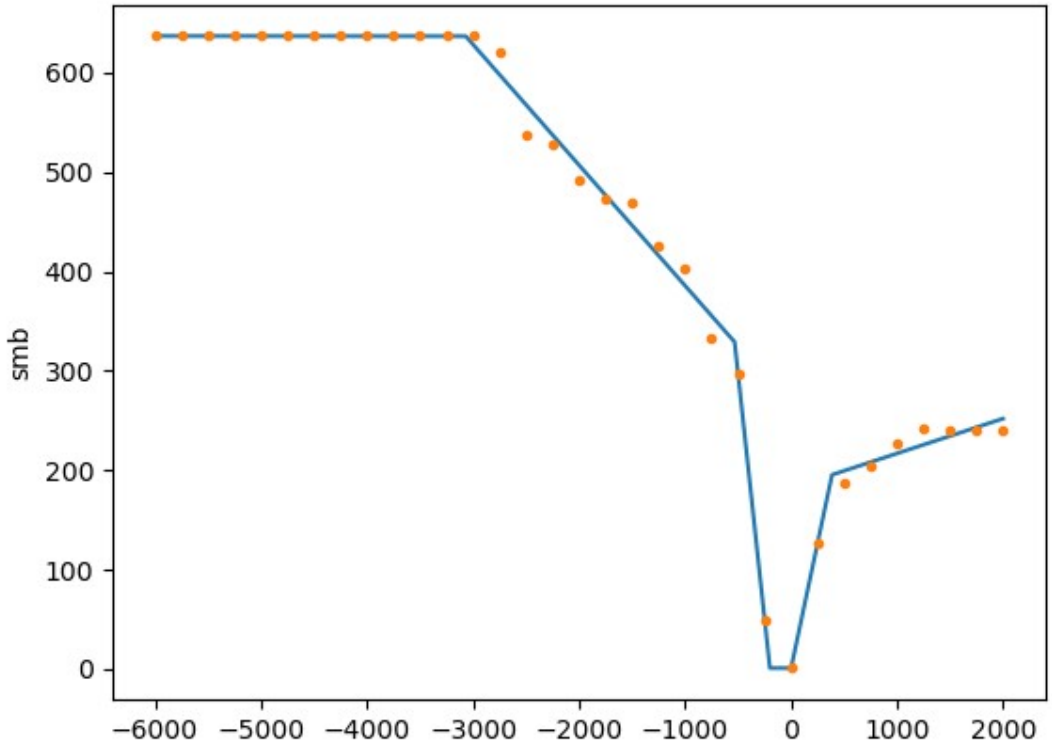
First, we compare the model SMB with observation data from PROMICE SMB data and ice cores used for GrSMBMIP (Fettweis et al. 2020). We only compare the model SMB with observations that are located within our glacier mask and have a measurement period over at least 6 months. Both model SMB and observation SMB are converted to mmWE/yr.



We define a range of model SMB-intervals with a spacing of 100 mmWE/yr. The objective is now to increase the width of the SMB-interval until at least 100 model/observation pairs are inside the interval bounds. The initial width of each SMB-interval is 20 mmWE/yr, and if the SMB-interval does not contain the requirement of 100 pairs, the SMB-interval is increased with an increment of ± 10 mmWE/yr until it meets the requirement.



Hereafter, we calculate the RMSE of the 80 percent best matching points in each SMB-interval, and the resulting RMS-error points are fitted using a piecewise linear fit.



The error function can now be used to estimate the corresponding SMB error of a given value of modeled SMB. We apply the error function in each basin and convert the SMB error to mmWE/month. The basin-summed monthly SMB error is subsequently multiplied with the theoretical standard deviation of a uniform distribution between -1 and 1, i.e., 2/sqrt(12) = 0.58. This corresponds analytically to the Monte Carlo sampling performed on the MAR data by Fettweis. This gives us the monthly SMB error for each basin.

The same method is used in Antarctica with the data set described in Wang et al 2021.

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