

Interactive comment on “An ice sheet model validation framework for the Greenland ice sheet” by Stephen F. Price et al.

Anonymous Referee #2

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The detailed review is in the attached PDF file with the following summary

The manuscript of Price and others describes and applies the method of a validation framework, called Cryospheric Model Comparison Tool (CMCT), that could potentially be extremely valuable for the validation of contemporary ice sheet model simulations against observations.

The observations comprise currently ICESat ice sheet elevation estimates and GRACE ice sheet mass change estimates. The presented ice sheet simulations of the Greenland ice sheet (GrIS) have used the dynamical “Community Ice Sheet Model” (CISM) version 2 with setups of different complexity and pseudo ice sheet simulations, where the applied spatial distribution of the surface mass balance (SMB) reduce the ice sheet elevation locally. These simulations are compared with the observations to highlight

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the added value of using dynamical models beside only applying SMB fields to the elevations and to show how the satellite produces could be used seamlessly to validate ice sheet simulations of the contemporary Greenland ice sheet. This tool box reduces drastically the need for adjusting commonly available satellite products when comparing them with simulations, because it converts the simulations data on the fly to the grids and footprints of the applied satellite products. Detailed ice sheet and basin-wide diagnostics (ice sheet elevation anomalies, mass changes, explained ice mass changes by the simulations), temporal evolutions (elevation differences for few periods and cumulative total mass change), and overall metrics (ice elevation differences and mass trends differences) are provided. The service that is offered as a web service seems to be available after registration; although I have not tried to use this service yet.

The manuscript is very well written, has a clear structure and all tables and figures, which are generally well prepared, are necessary. It was a pleasure to review this manuscript. I hope that the manuscript could be published soon, because I will be extremely helpful to have this information and the offered service.

I recommend the publication of the manuscript after some minor corrections.

Please also note the supplement to this comment:

<http://www.geosci-model-dev-discuss.net/gmd-2016-97/gmd-2016-97-RC2-supplement.pdf>

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-97, 2016.

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