Response to the editor's comment

In this manuscript, we conducted simulations to analyze the latent heat flux. To ensure clarity, we chose to disable the blowing snow module within the MAR model simulation. Both reviewers encouraged us to provide a sensitivity analysis of latent heat flux given this choice. The editor, thus, requested such sensitivity analysis prior to reconsidering our manuscript.

In response to this request, we now present a direct comparison between simulations with and without simulated blowing snow effects for the summer months of 2019 (June and July). Note that this period aligns with the one discussed in more detail within the manuscript.
Unfortunately, a change in the computing system prevented us from running the same model version used in the manuscript. Instead, the comparison presented here is based on the latest MAR version (MARv3.14), which may result in slight variations from the exact results in the manuscript.

The figures (Figs 1-3) show that the effects of blowing snow on latent heat flux are minor compared to the differences between the observations and the simulation, as presented in the manuscript, and that the developed correction function is based on.
Specifically, the primary effect is noticeable in the diurnal range of the latent heat flux, while the diurnal mean remains largely unchanged (Fig. 1a, black dash).

Given that it is the diurnal mean latent heat flux that influences the summer surface mass balance, independent of diurnal variations, we conclude that our study's findings remain robust, regardless of the effect of simulating blowing snow. This is true for the EGRIP location (Figs 1-2) as well as for the interior ice sheet where the effects of blowing snow on the latent heat flux commonly stay well below 1 Wm^{-2} (Fig. 3).

It is furthermore worth noting that the blowing snow module within the MAR model has not yet been evaluated against observations on the Greenland Ice Sheet. Given the insensitivity of our results to the application of the module, we have opted to keep the less complex model setup (without blowing snow) simulation in our analysis.

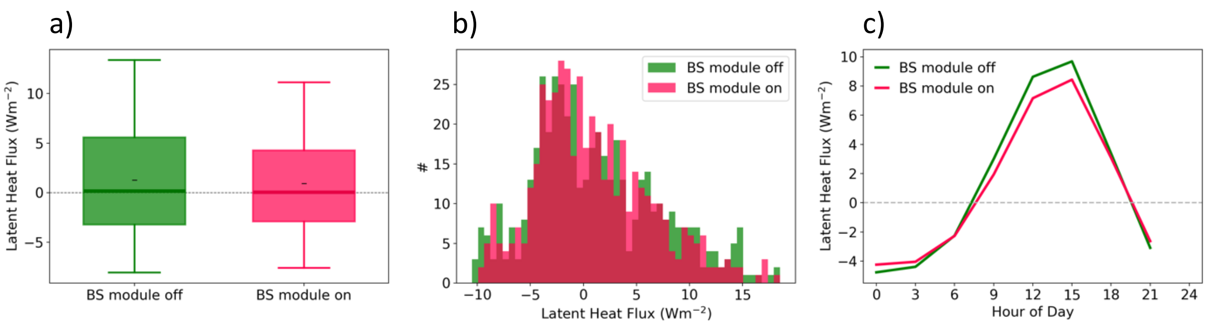

Fig. 1: Distribution (a,b) and diurnal cycle (c) of the simulated three-hourly latent heat flux without (green) and with (magenta) the effects of blowing snow simulated in the MAR model for June and July 2019 at the EGRIP location. The black dash in (a) shows the mean value, the thick line shows the median, the box indicates the 25-75th percentile, and the whiskers the 5-95th percentile.

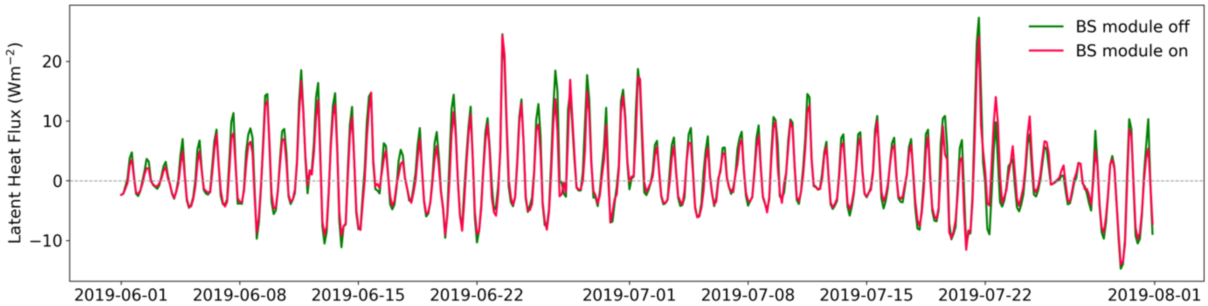

Fig. 2: Timeseries of the three-hourly simulated latent heat flux in June and July 2019 at the EGRIP location without (green) and with (magenta) the effects of blowing snow simulated in the MAR model.

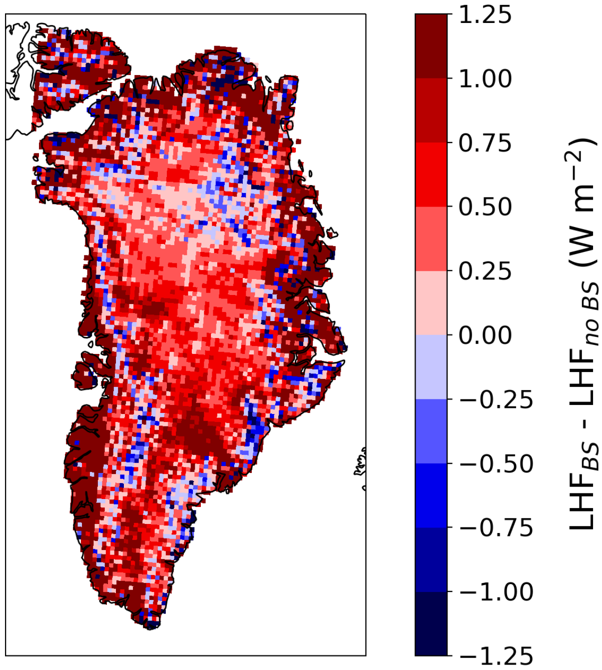

Fig. 3: Average impact of simulating the effects of blowing snow (BS) in MAR on the latent heat flux (LHF).