## Supplement of: Bayesian inversion of Arctic sea ice and snow thickness from satellite altimetry

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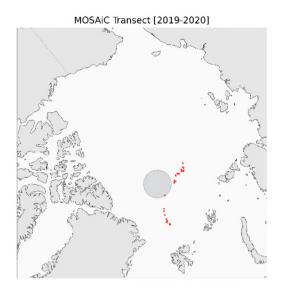
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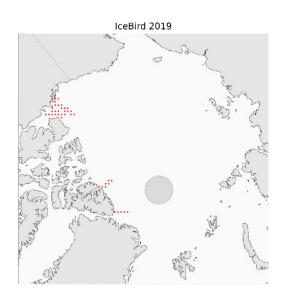
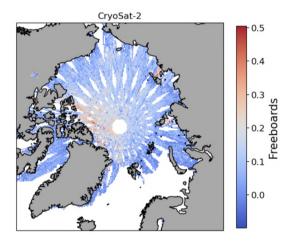
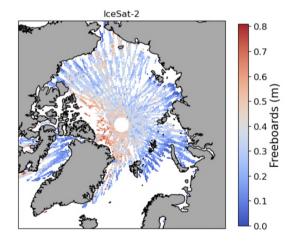
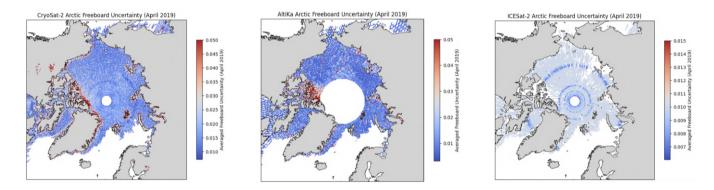


Figure S1. (left) MOSAiC tracks for Winter 2019-2020 (right) IceBird tracks for 2019/04





**Figure S2.** Example of input for April 2019 with the CS-IS satellite combination. The input is composed of daily along-track data binned on a 25 km<sup>2</sup> EASE2 grid of along track freeboards for each satellite.



**Figure S3.** Input uncertainties used for 2019/04.

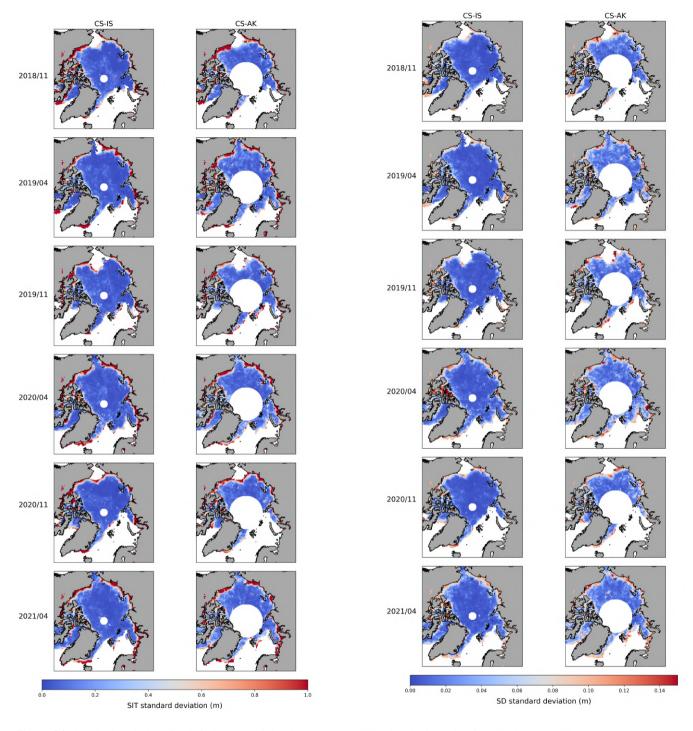


Figure S4. Standard deviations for (left) SIT and (right) SD, computed following the inversion for CS-IS-2p and CS-AK-2p.

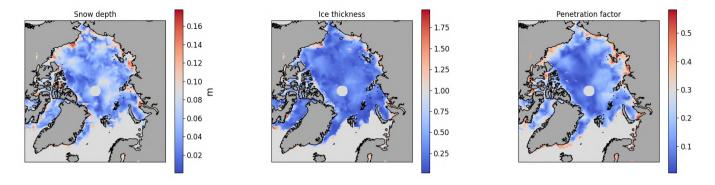


Figure S5. Standard deviations for the model CS-IS-3p for April 2019

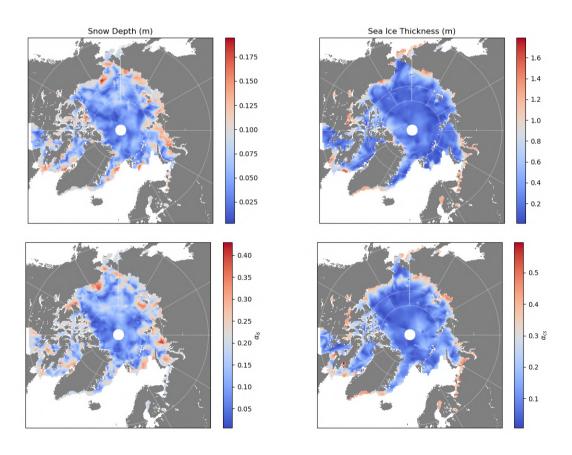
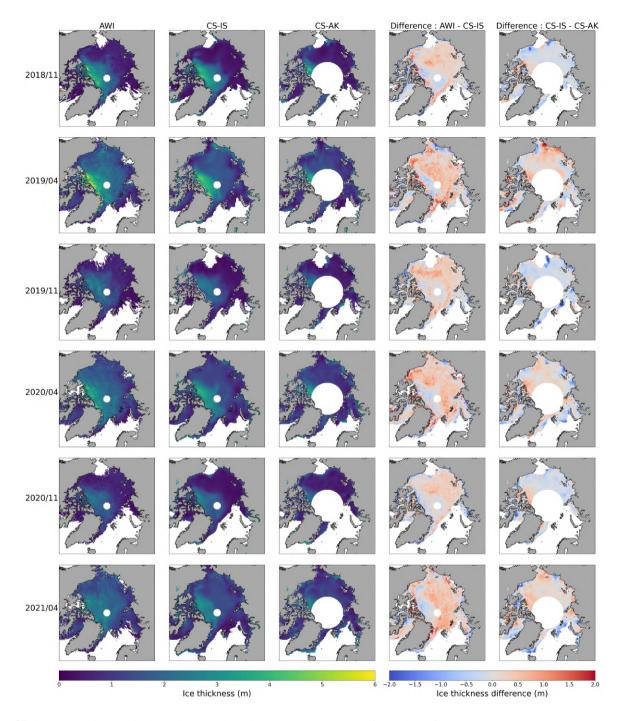
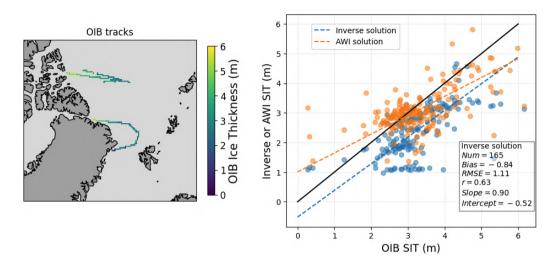


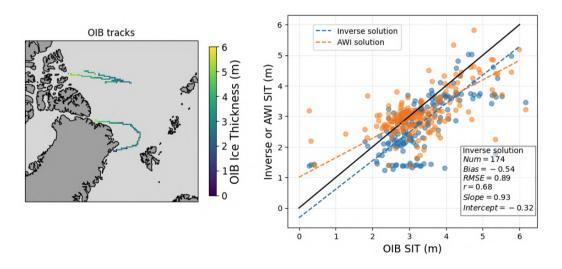
Figure S6. Standard deviations for the model CS-IS-4p for April 2019.



**Figure S7.** Same than Figure 1 (in the main paper) but with a constant 2 cm error for the input freeboards.



**Figure S8.** Comparison against OIB for SIT with CS-IS-2p-LARM and  $\alpha_{cs} = 0.75$ .



**Figure S9.** Comparison against OIB for SIT with CS-IS-2p-LARM and  $\alpha_{cs}=0.85$ .

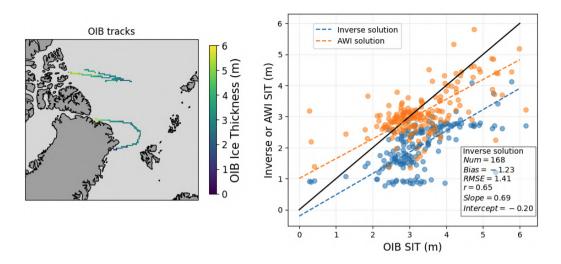
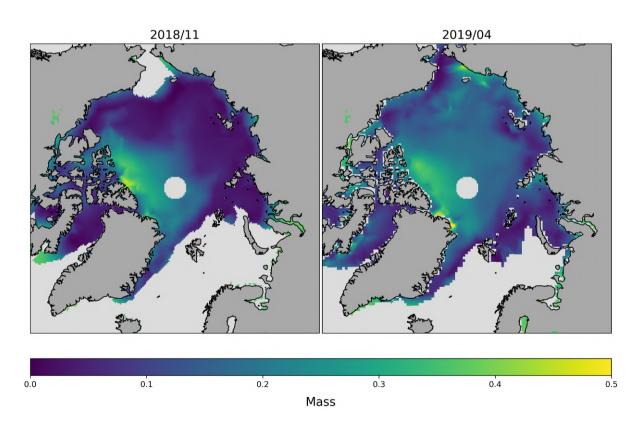


Figure S10. Comparison against OIB for SIT with CS-IS-2p-LARM and  $\alpha_{cs}=0.65$ .



**Figure S11.** Inversion solution when inverting for the mass  $\frac{\rho_w - \rho_i}{\rho_w} H_i$  for November 2018 and April 2019.