

Supplement of “An airborne all-sky radiative closure test of microwave radiometers”

Lei Liu^{1,6}, Natalia Bliankinshtein², Yi Huang¹, John R. Gyakum¹, Philip M. Gabriel³, Cuong Nguyen², Keyvan Ranjbar², Kenny Bala², Zhipeng Qu⁴, Paloma Borque², Leonid Nichman², Mengistu Wolde², Dirk Schuettemeyer⁵

¹Department of Atmospheric and Oceanic Sciences, McGill University, Montreal, Quebec, Canada

²Flight Research Laboratory, National Research Council Canada, Ottawa, Ontario, Canada

³Horizon Science and Technology, Wolfville, Nova Scotia, Canada

⁴Environment and Climate Change Canada, Toronto, Ontario, Canada

⁵European Space Agency, Noordwijk, South Holland, Netherlands

⁶Present Address: Department of Earth System Sciences, University of Hamburg, Hamburg, Germany

Correspondence to: Lei Liu (lei.liu5@mail.mcgill.ca)

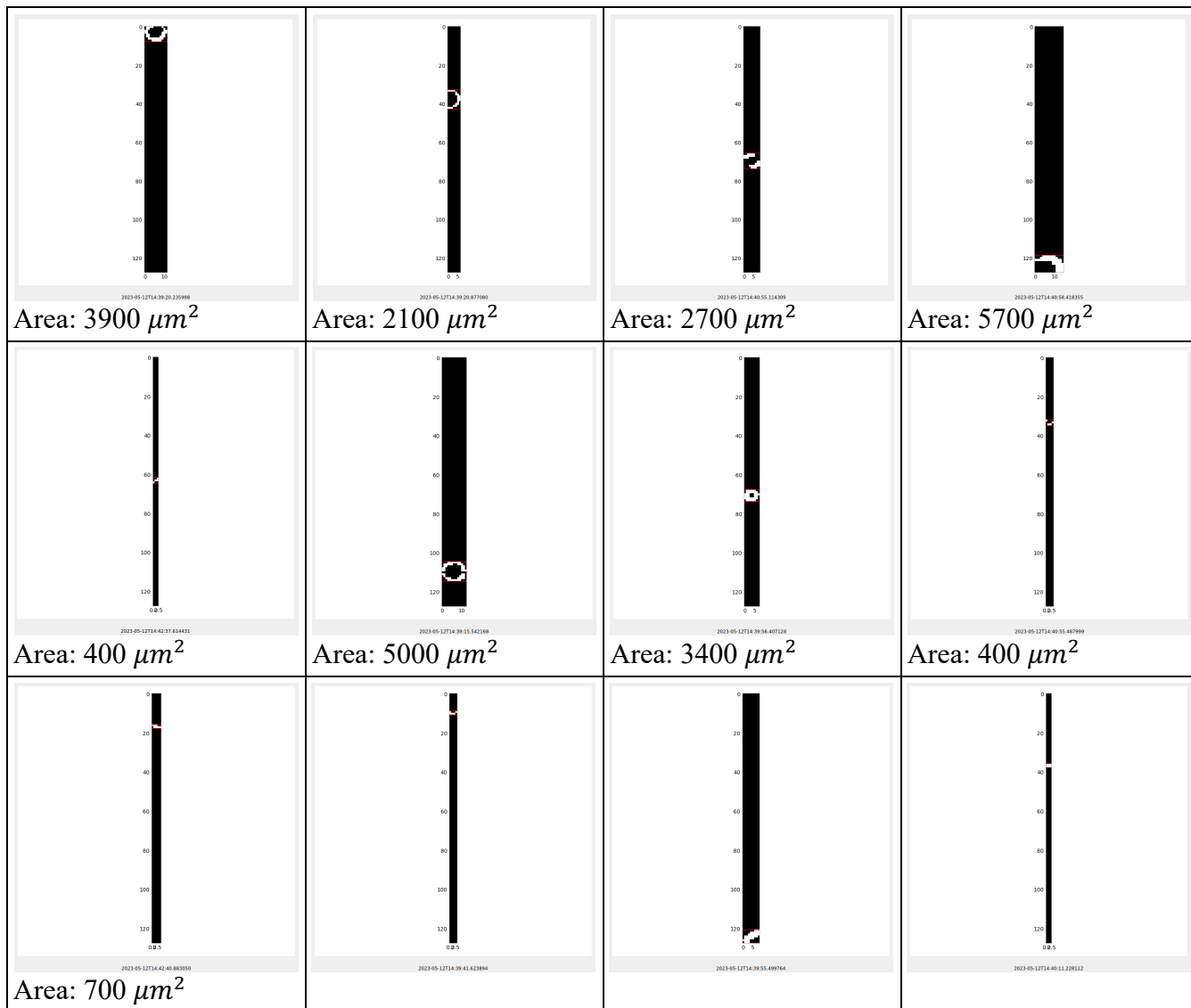


Figure S1: Example particle images observed by the vertical channels of the 2D-S probe between 14:39 and 14:43 UTC on 12 May 2023, during the research flight. The projected areas are indicated for selected particles.

The HiSRAMS radiative closure simulated uncertainties ($\sigma_{BT_{sim}^v}$), along with the simulated uncertainties caused by temperature ($\sigma_{BT_{sim-t}^v}$), water vapour concentration ($\sigma_{BT_{sim-wv}^v}$), and cloud absorption ($\sigma_{BT_{sim-cld}^v}$), are presented in Figure S2 through Figure S5, respectively.

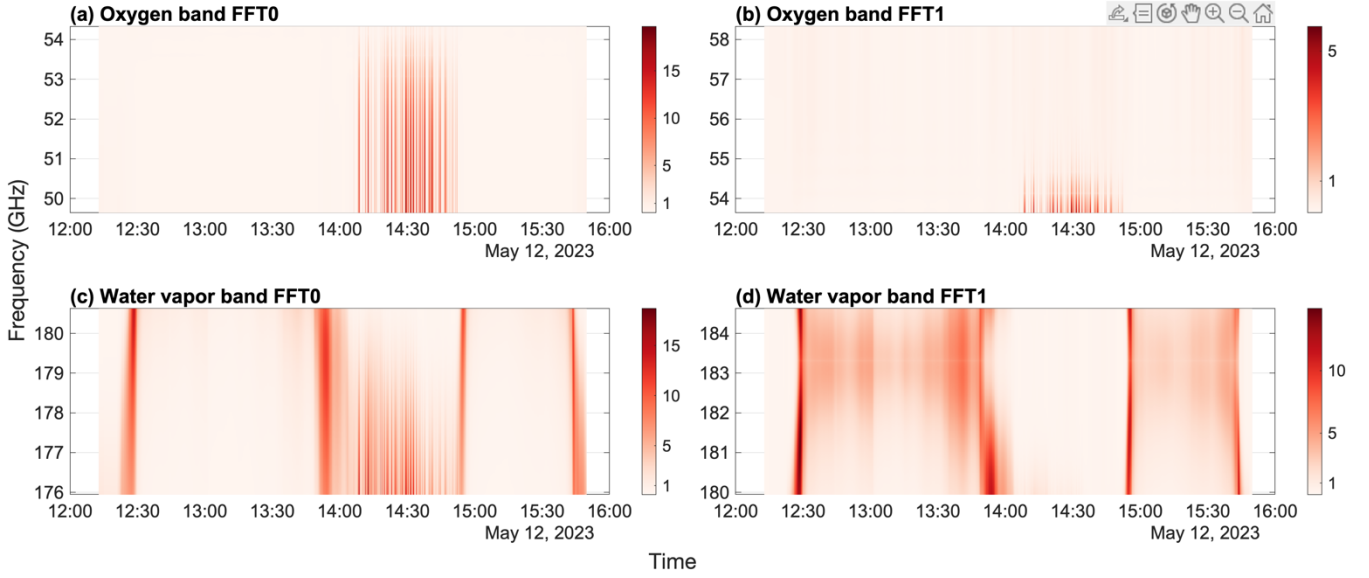


Figure S2: Radiative closure simulated uncertainties ($\sigma_{BT_{sim}^v}$) for HiSRAMS during flight F03. The colour maps are displayed in units of K.

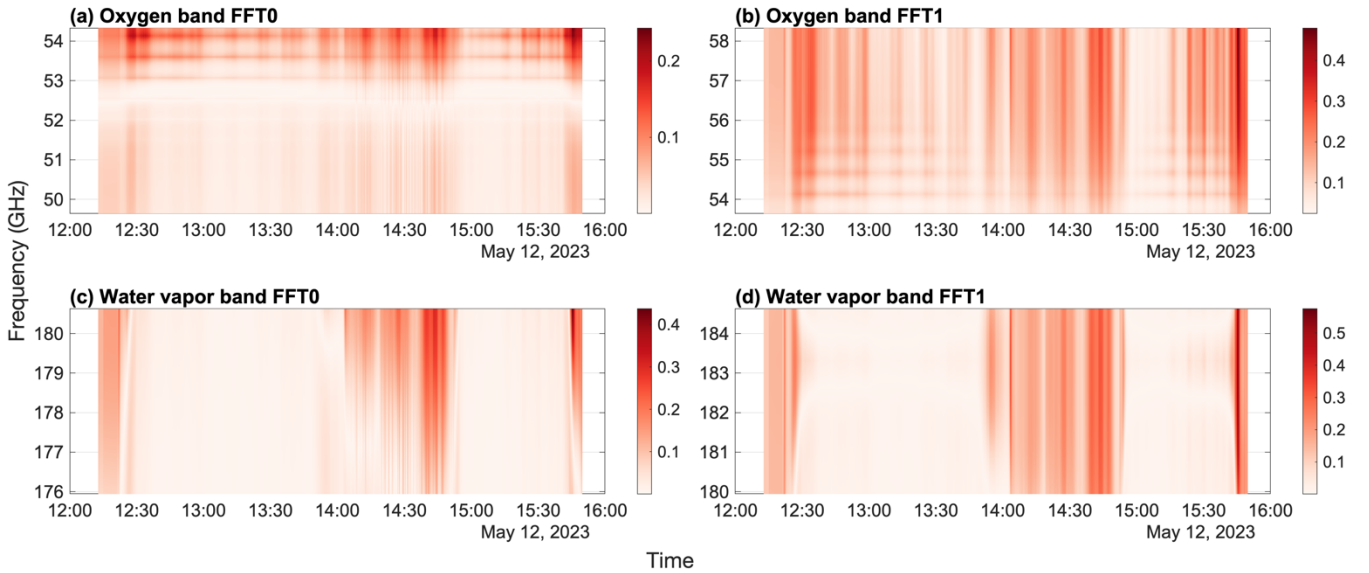


Figure S3: Radiative closure simulated uncertainties ($\sigma_{BT_{sim-t}^v}$) caused by temperature for HiSRAMS during flight F03. The colour maps are displayed in units of K.

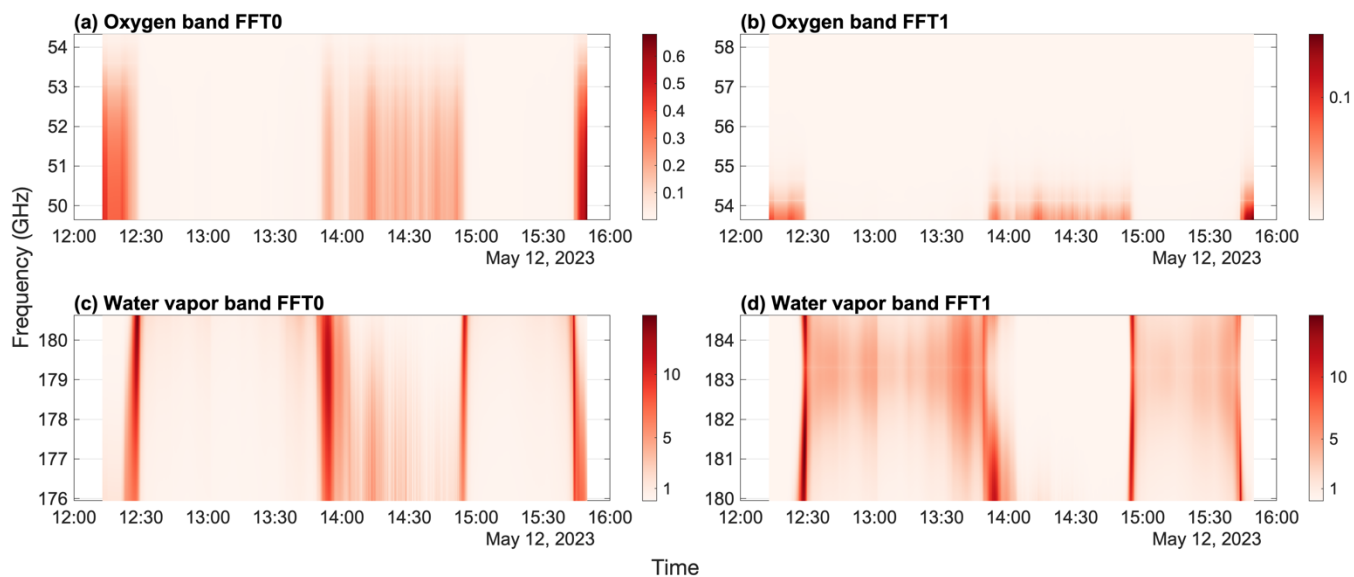


Figure S4: Radiative closure simulated uncertainties ($\sigma_{BT_{sim-wv}}^v$) caused by water vapor concentration for HiSRAMS during flight F03. The colour maps are displayed in units of K.

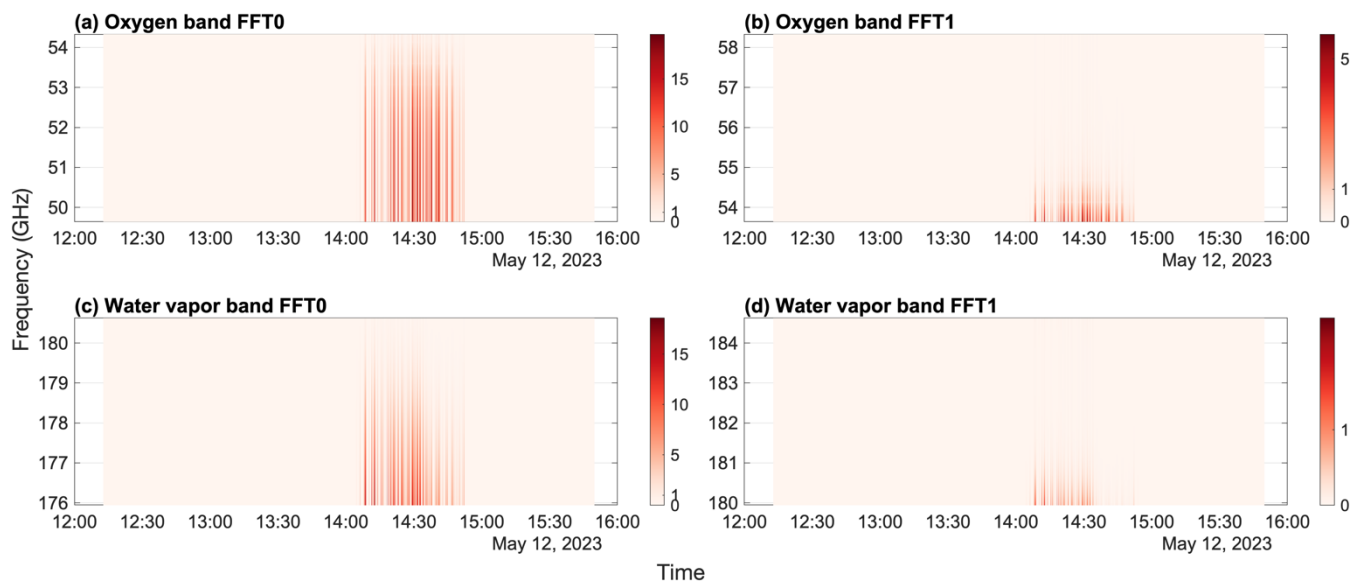


Figure S5: Radiative closure simulated uncertainties ($\sigma_{BT_{sim-ctd}}^v$) caused by cloud absorption for HiSRAMS during flight F03. The colour maps are displayed in units of K.