Supplement of

Constraining a Radiative Transfer Model with Satellite Retrievals: Implications for Cirrus Clouds Thinning

Ehsan Erfani[1], David L. Mitchell[1]

[1] Division of Atmospheric Sciences, Desert Research Institute, Reno, Nevada, USA

Correspondence to: Ehsan Erfani, (Ehsan.Erfani@dri.edu)
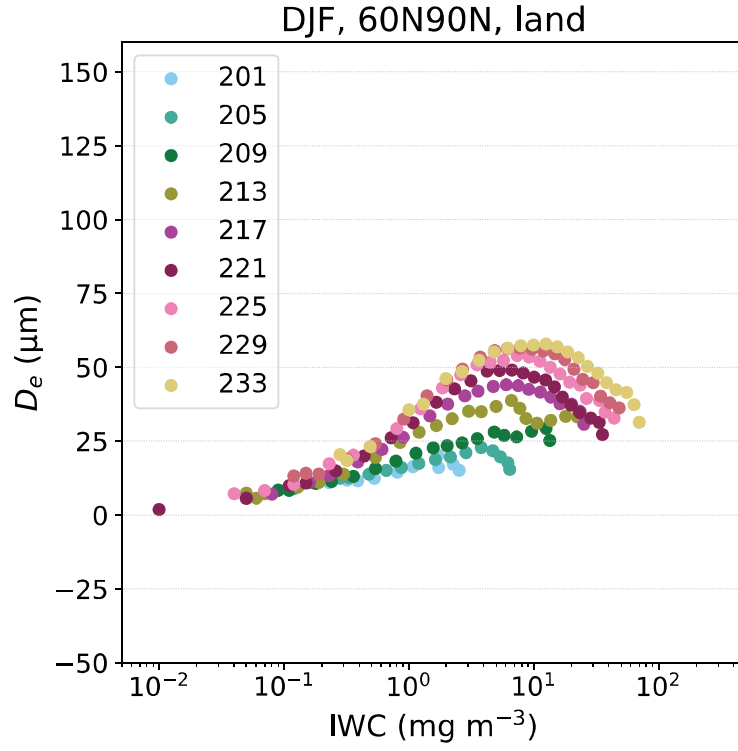
DJF, 60N90N, land

Figure S1. The results of CALIPSO retrievals for Arctic land during the winter showing D_e vs. IWC. Each marker is not a single data point, but the mean value of all data points within a 4-K temperature bin and a 0.1 log of extinction coefficient bin. Each color shows a different temperature bin with their middle point value in the legend in units of K.

a)
MERRA2 Sea Ice Fraction, Jan 2000-2020

b)
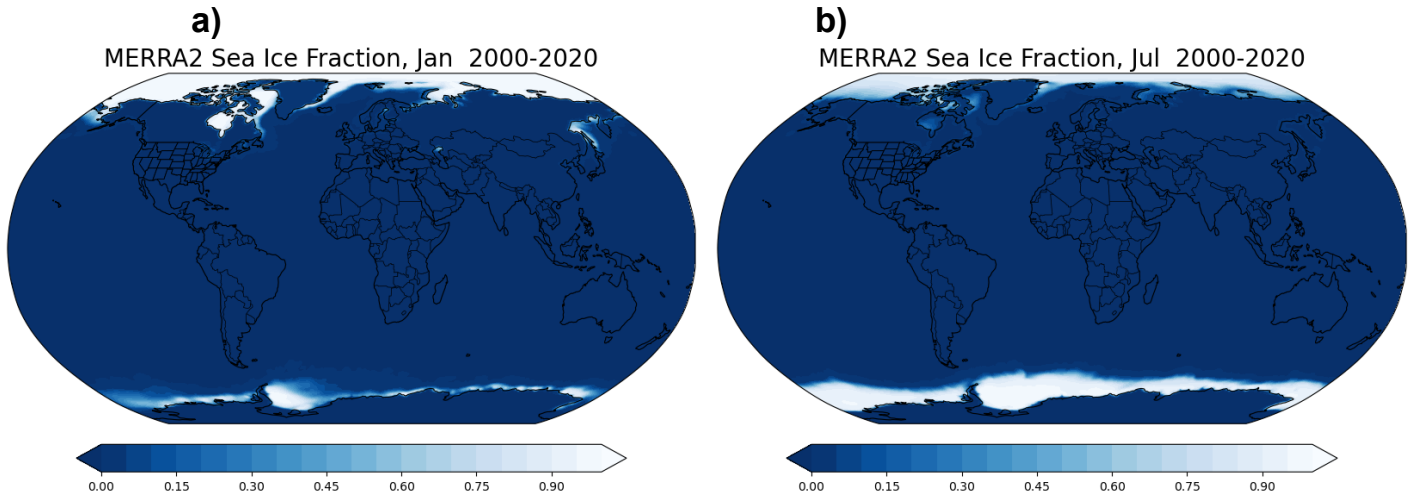MERRA2 Sea Ice Fraction, Jul 2000-2020

Figure S2. 20-year (2000-2020) climatology of sea ice fraction for two months (Jan. and Jul.) from NASA MERRA2 data.
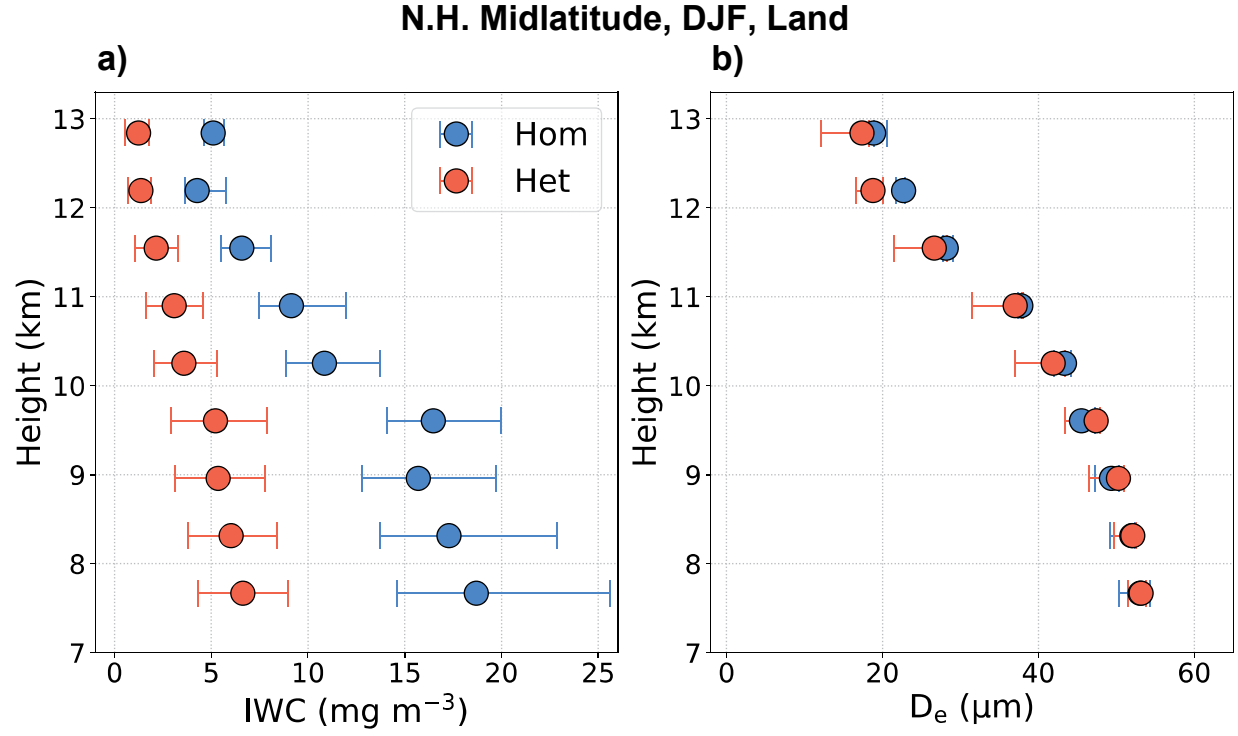
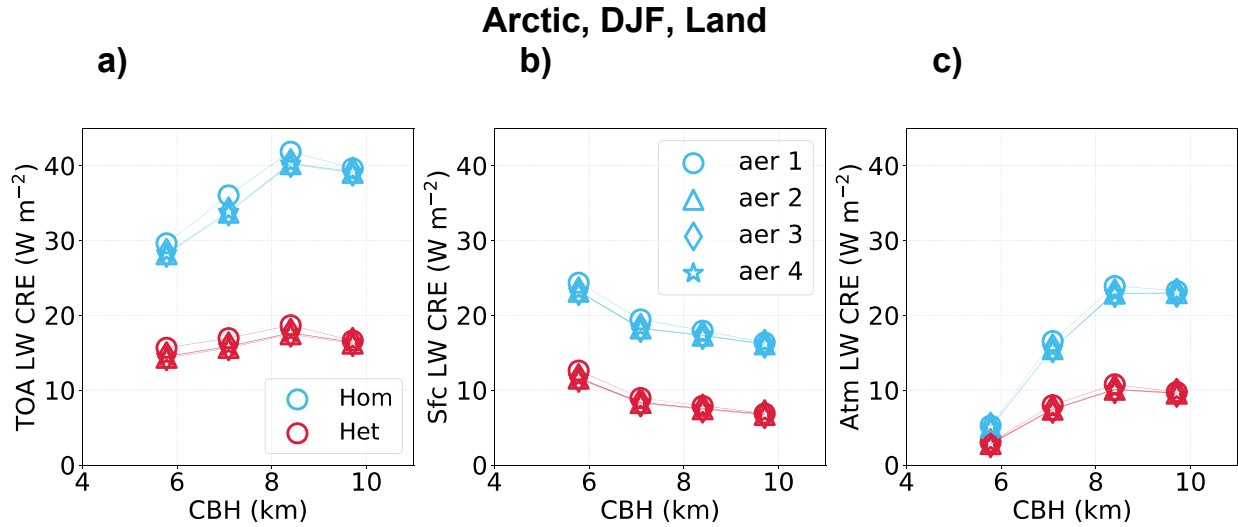Figure S3. As in Fig. 3, but the CALIPSO profiles are for N.H. midlatitude.

Figure S4. Sensitivity of RTM-simulated cirrus CRE to four different atmospheric aerosol conditions specified as 1) "marine haze, low volcanic", 2) "urban haze, low volcanic", 3) "marine haze, high volcanic", and 4) "urban haze, high volcanic".