

Radiometric Simulations for Horizontal Views of Mixed-Phase Clouds

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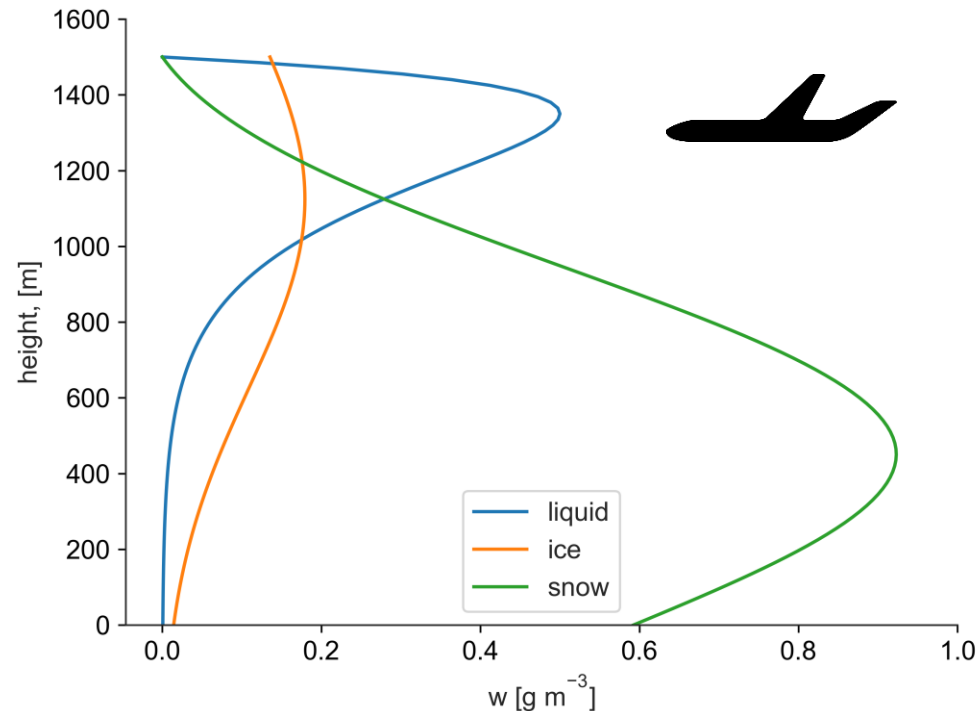
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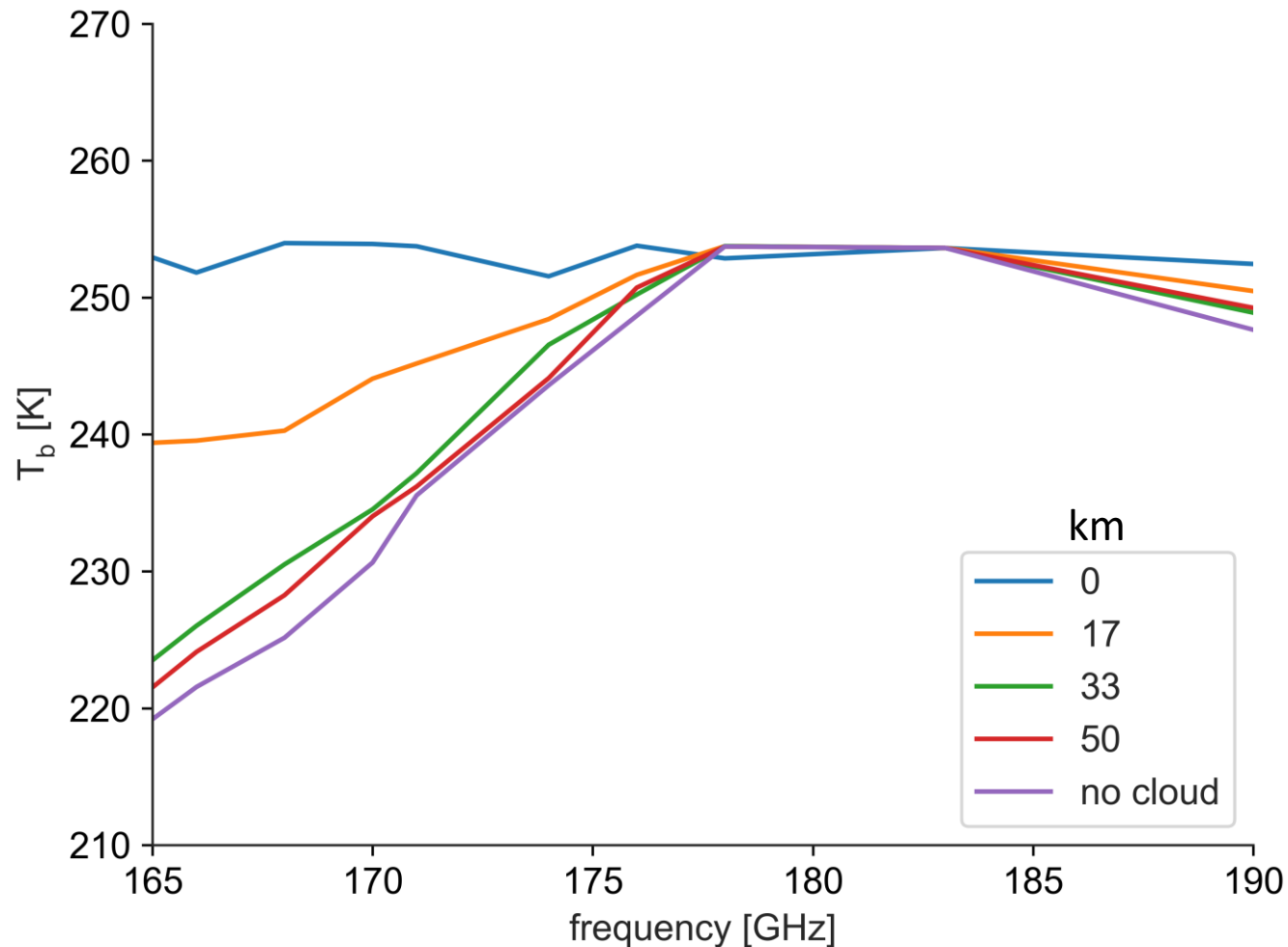
Arctic Mixed-Phase Cloud¹

- Cloud
 - 111 km along sensor LOS
 - FASCOD subarctic winter
 - Micron-sized droplets
 - Oriented ice plates
 - Oriented snow spheroids
- Sensor
 - 1350 m altitude
 - $T_{\text{amb}} = -15^{\circ}\text{C}$ @ flt. altitude
 - NEDT = 0.5 K
 - HPBW = 1°

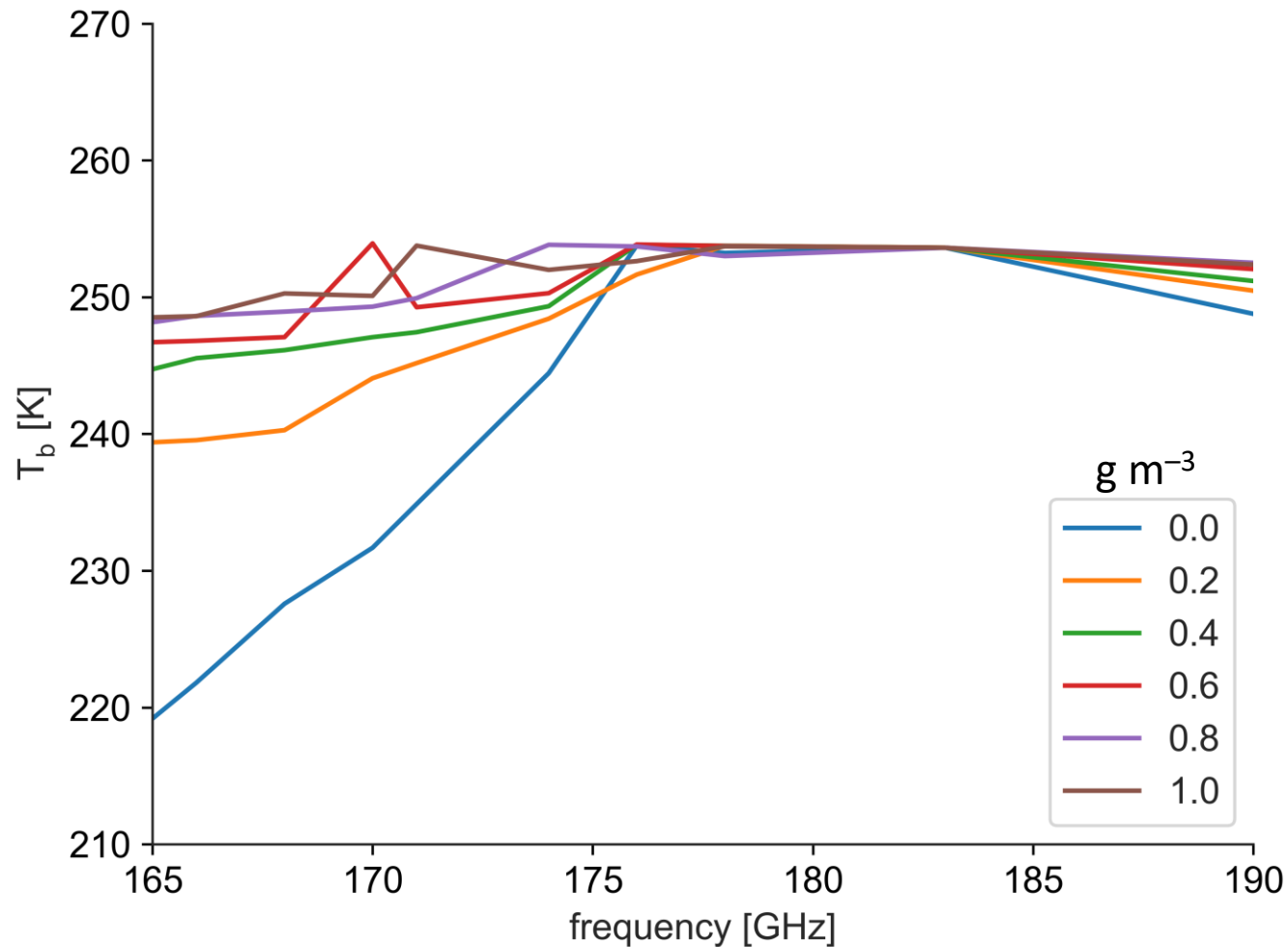


¹Shupe et al. 2008 (10.1175/2008BAMS2378.1)

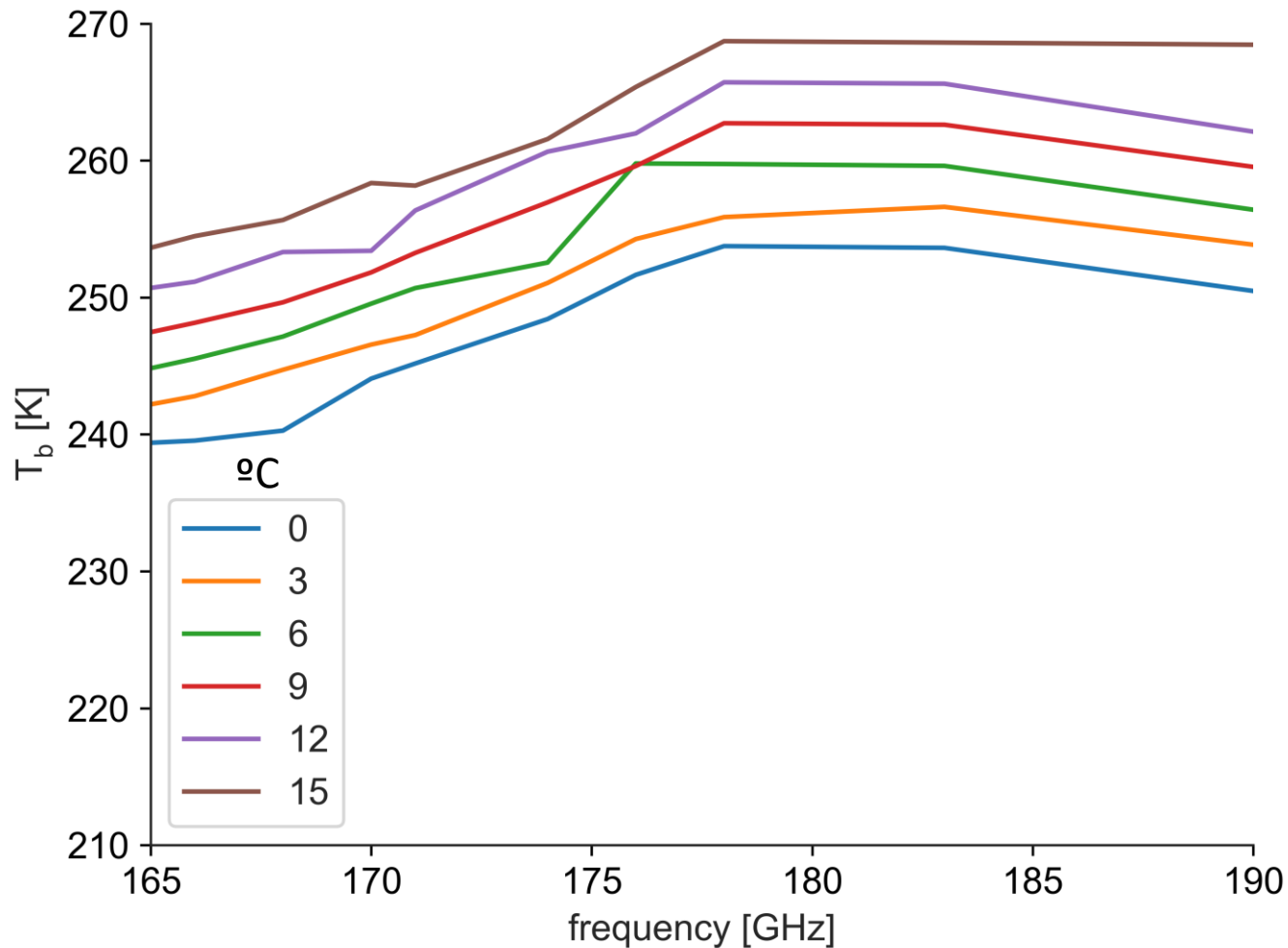
Varying Distance ($LWC = 0.2 \text{ g m}^{-3}$, $T_{\text{shift}} = 0^\circ\text{C}$)



Varying Liquid ($d = 17$ km, $T_{\text{shift}} = 0^\circ\text{C}$)



Varying T_{shift} ($d = 17$ km, $\text{LWC} = 0.2$ g m $^{-3}$)



G-band Results

- Strong dependence on distance to cloud
 - Maximum range exceeds well beyond 15 km
- Strong dependence on liquid
- Adding shift to temperature profile shifts T_b
 - Temperature offset to FASCOD temperature profile