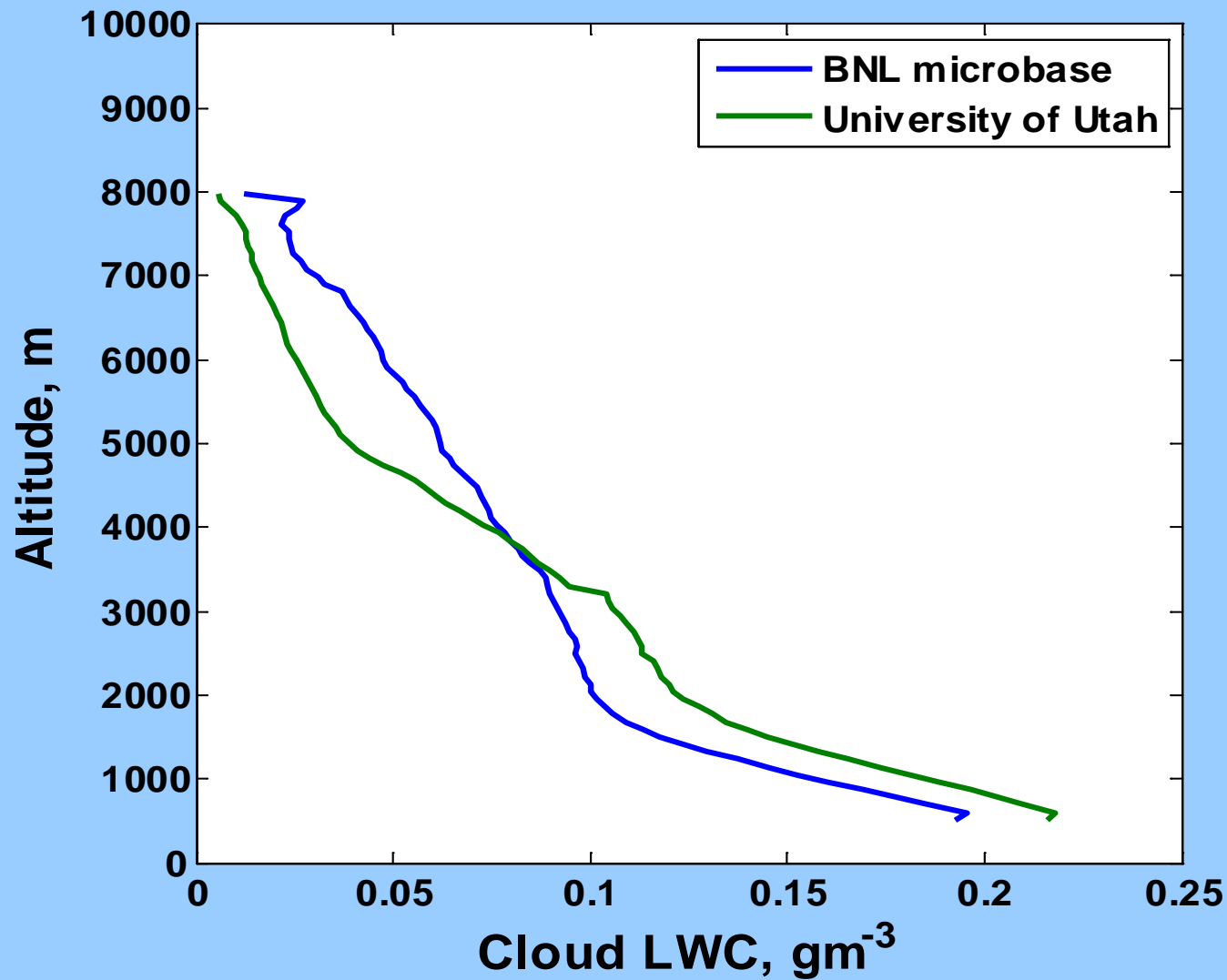


A warm cloud microphysics dataset based on dual-frequency radar measurements

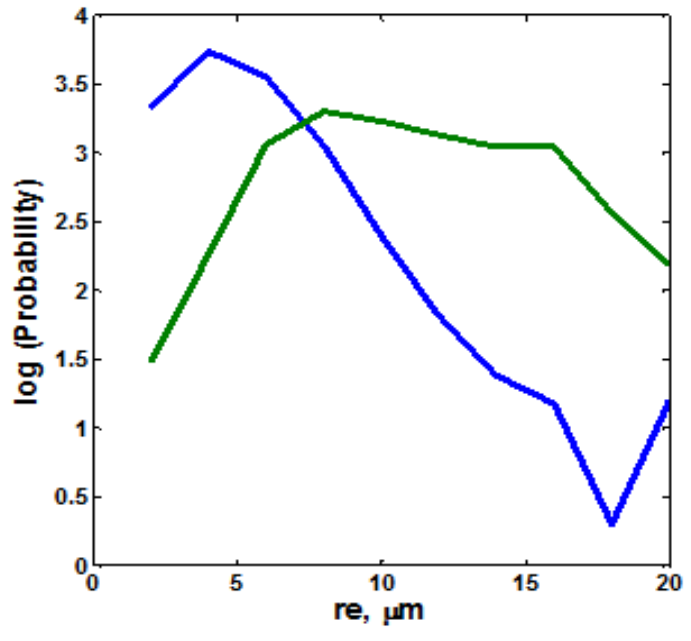
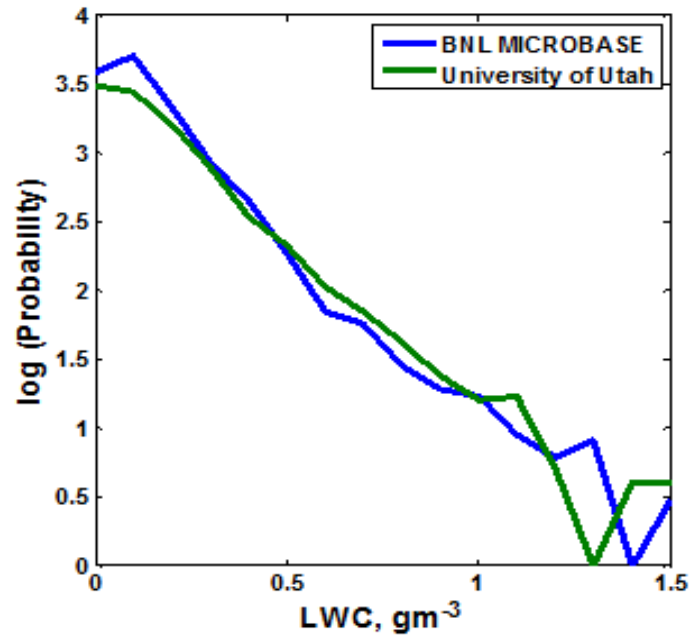
Dong Huang

FASTER breakout session
March 8, 2011

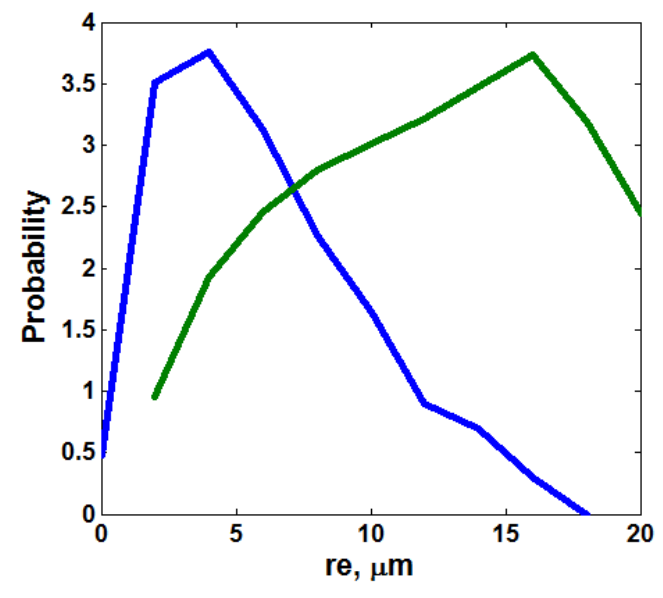
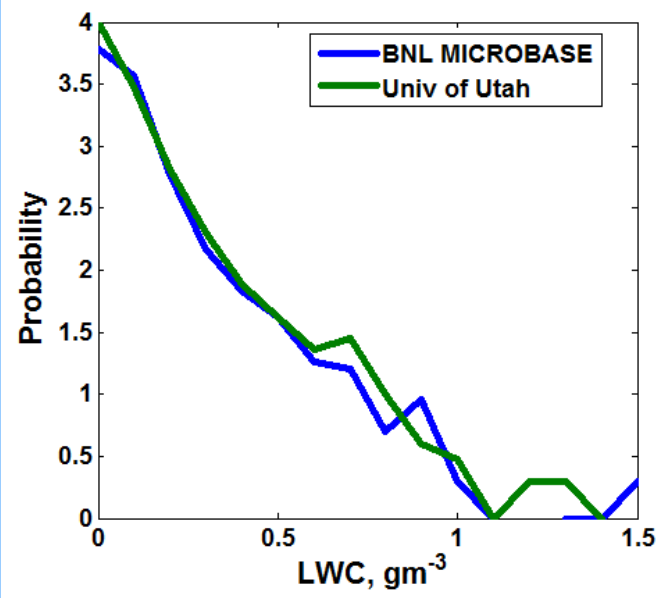
Vertical profiles of nine-year mean cloud LWC at SGP site



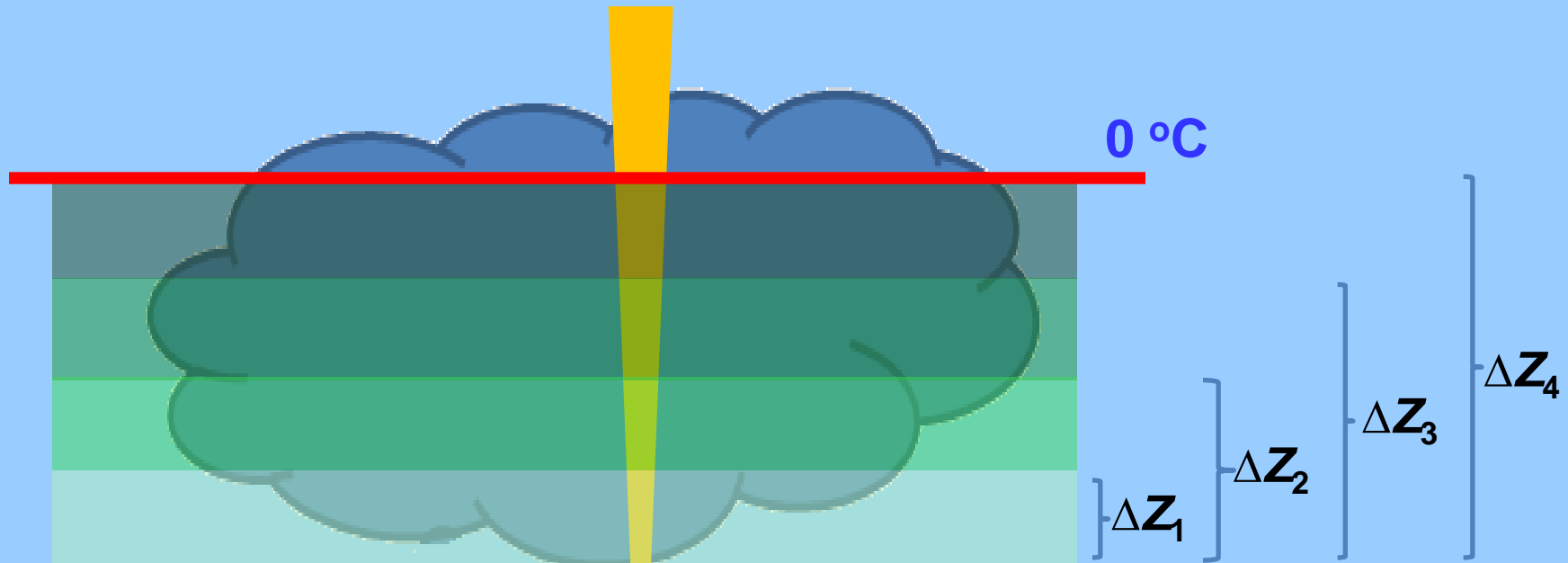
Warm liquid



Supercooled water



Dual-frequency radar approach



$$\Delta Z_1 = m_1$$

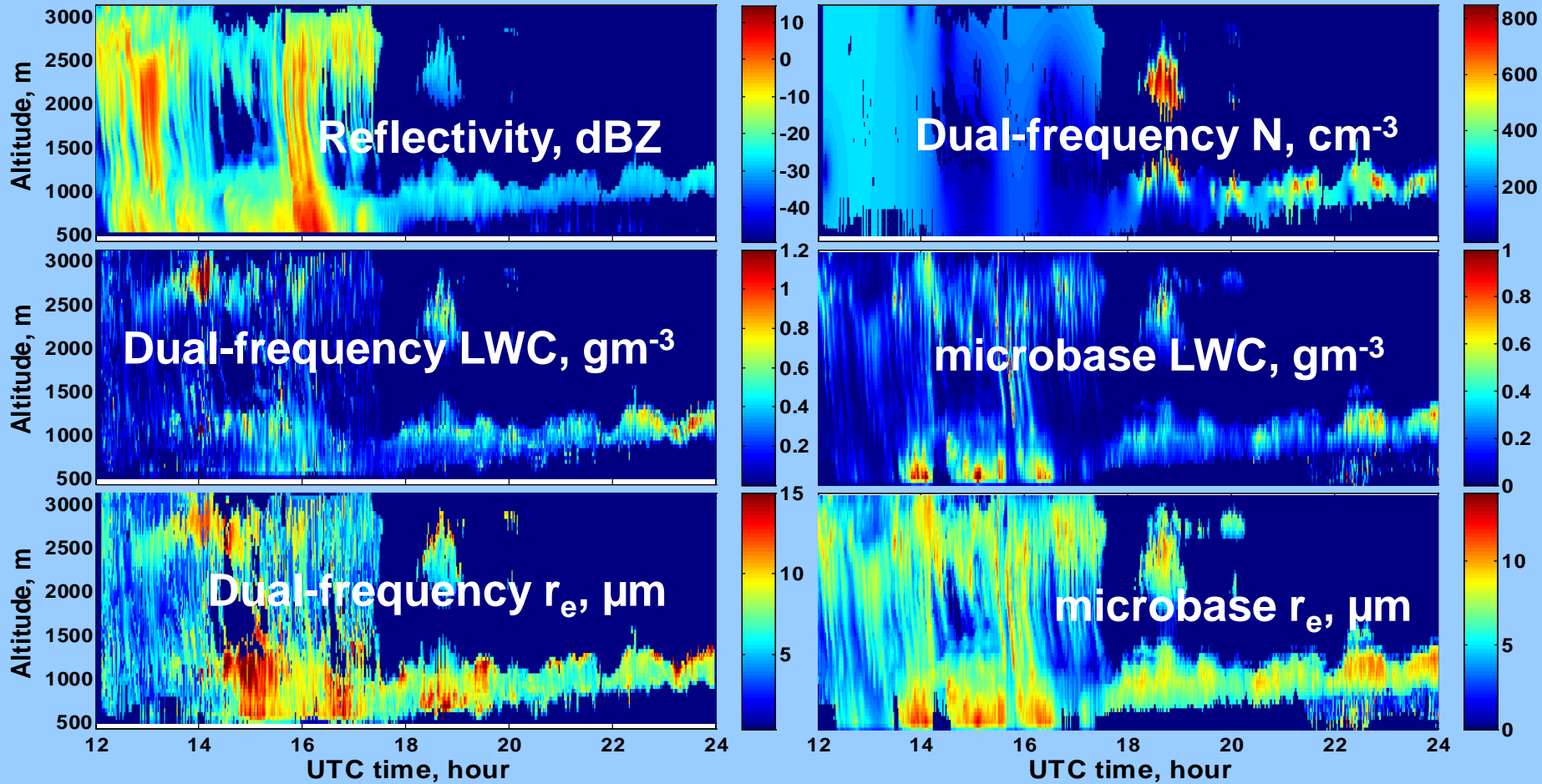
$$\Delta Z_2 = m_1 + m_2$$

$$\Delta Z_3 = m_1 + m_2 + m_3$$

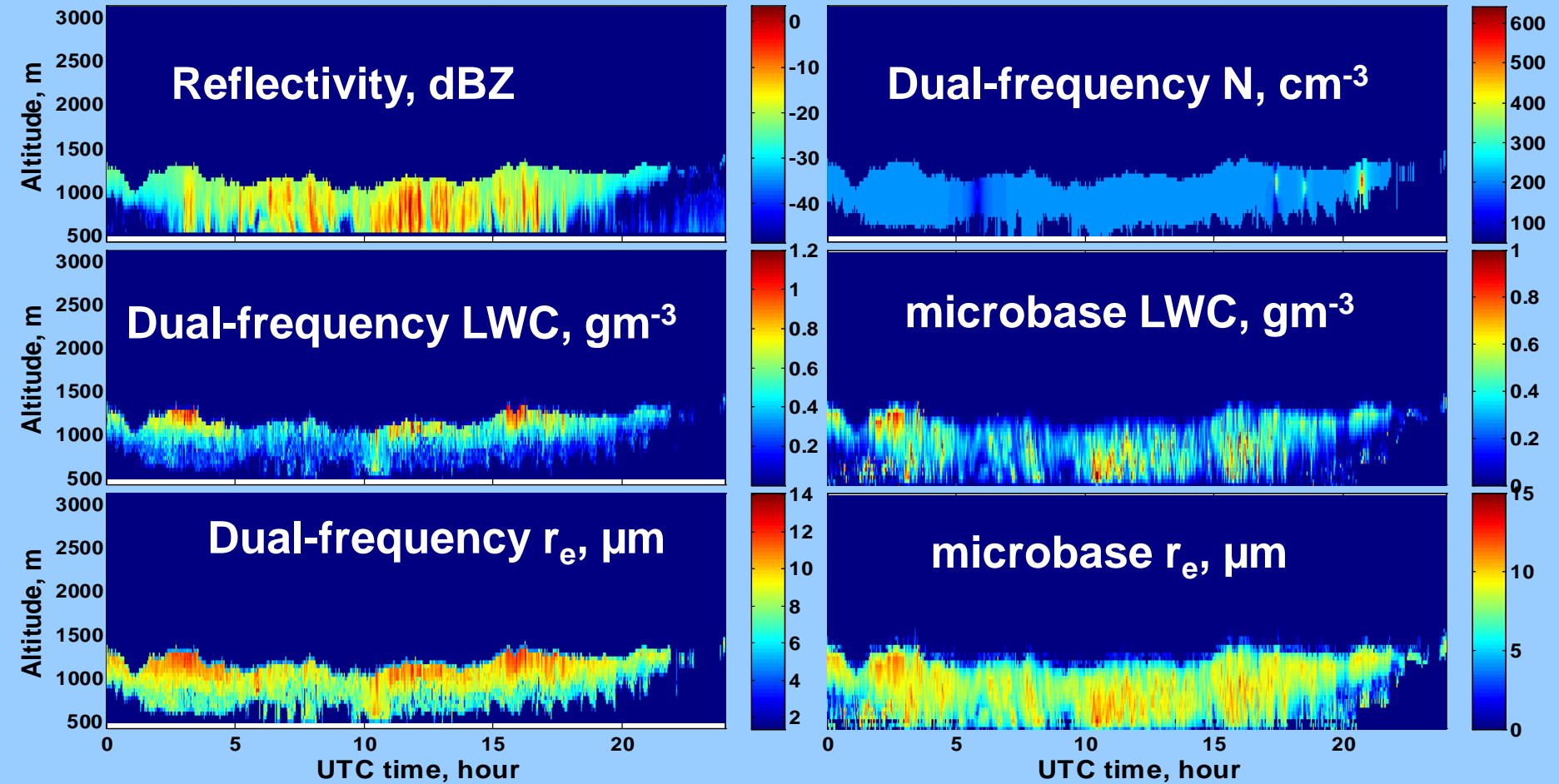
$$\Delta Z_4 = m_1 + m_2 + m_3 + m_4$$



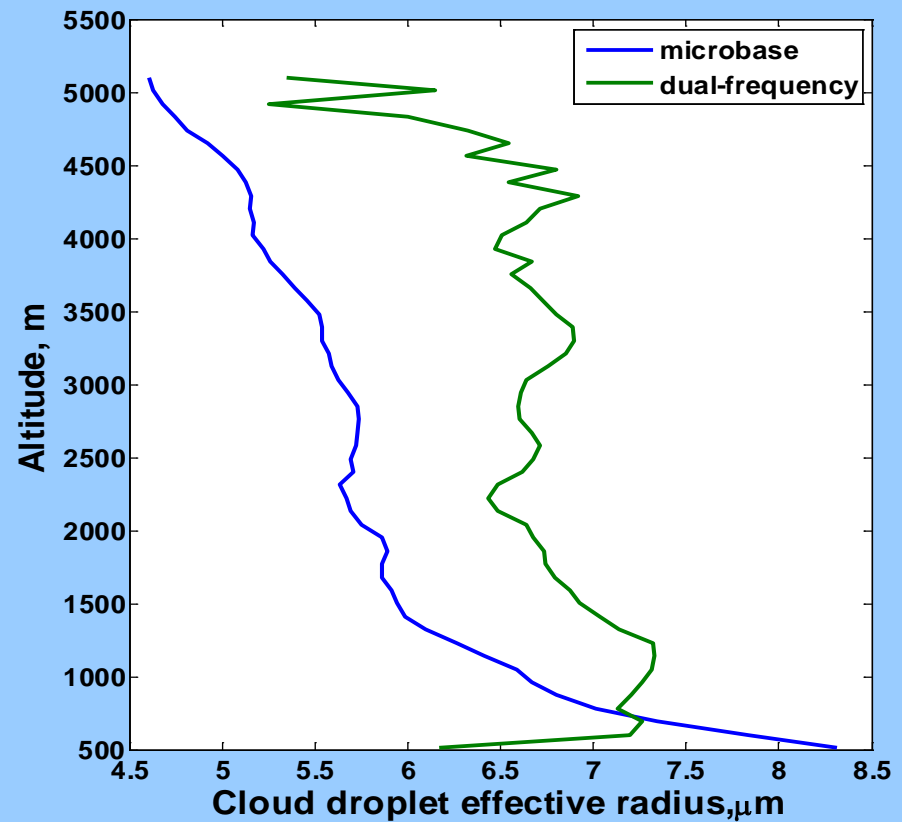
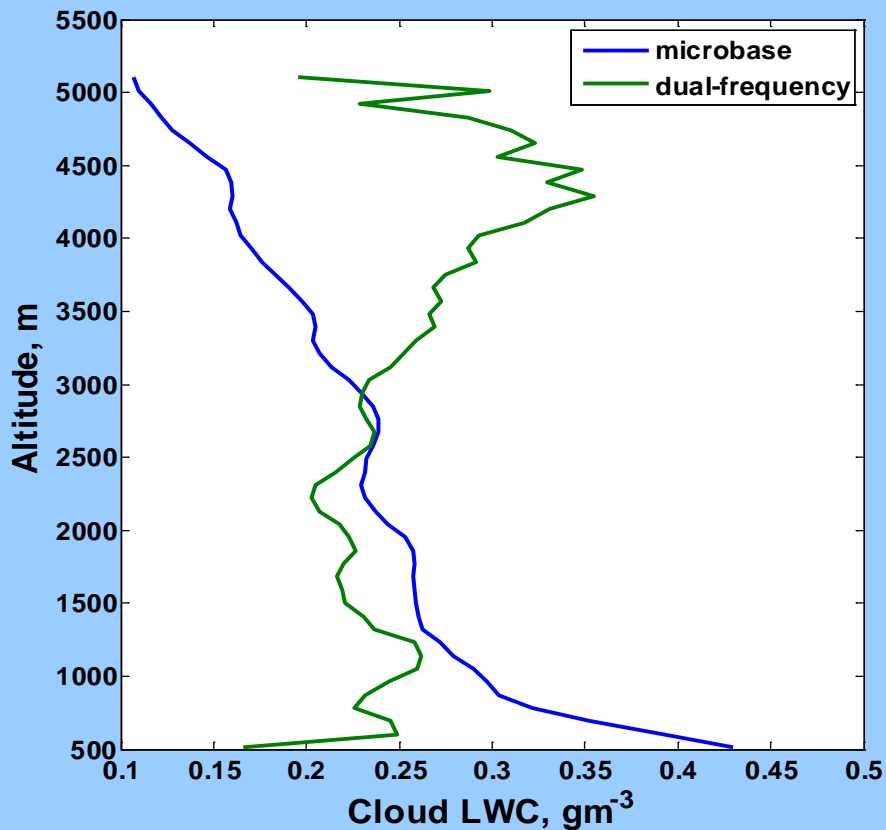
Dual-frequency retrieval example: 20060506

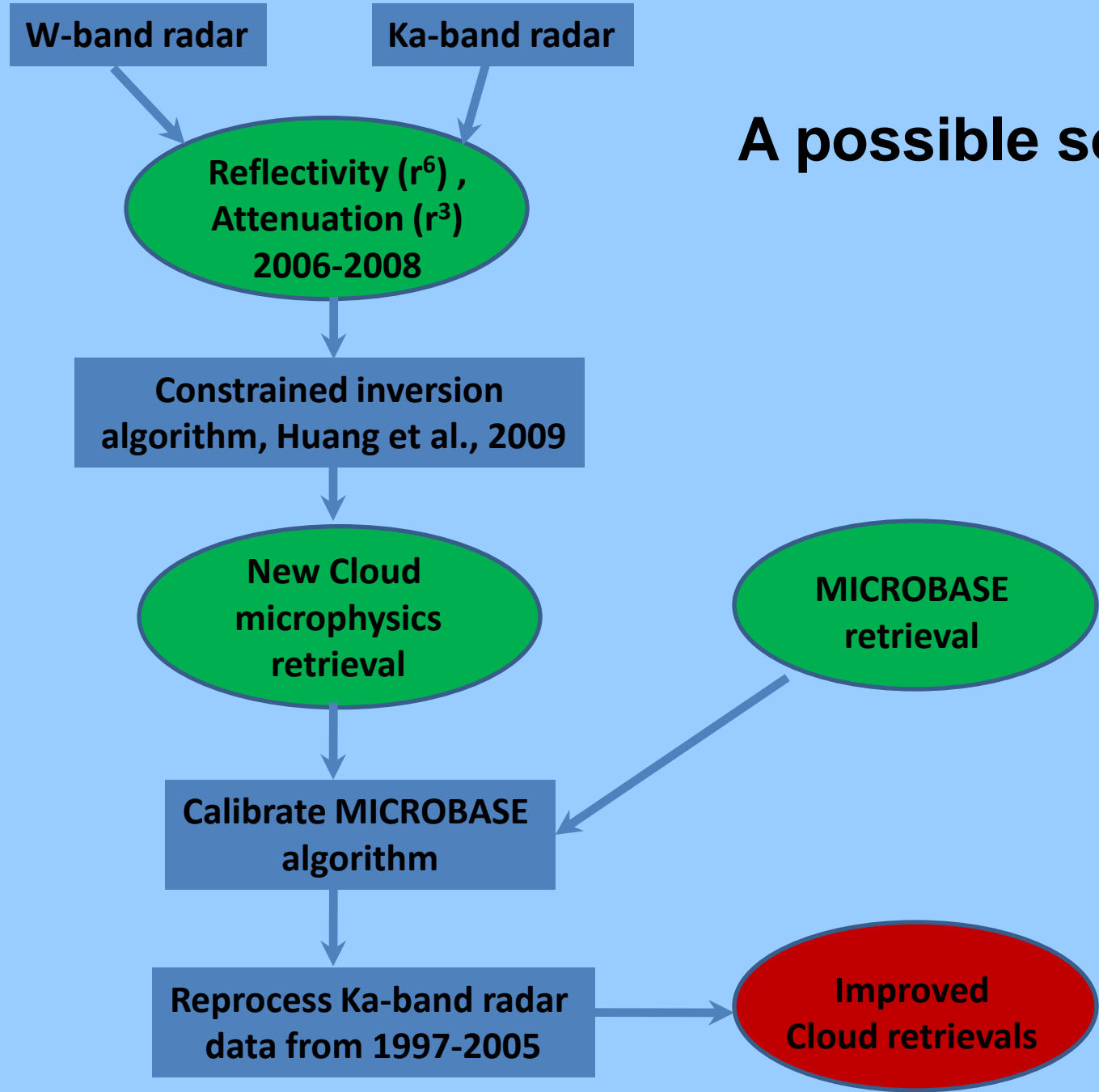


Dual-frequency retrieval example: 20060507



Yearly-mean dual-frequency retrievals compared with MICROBASE (2006)





A possible solution

Summary

Bias found at existing cloud retrievals due to drizzle/rain contamination.

Radar attenuation approach provides more physical LWC and re retrieval.

Radar attenuation plus radar reflectivity can be used to “calibrate” Microbase algorithm and the calibrated algorithm can be used to reprocess long-term ARM radar data.