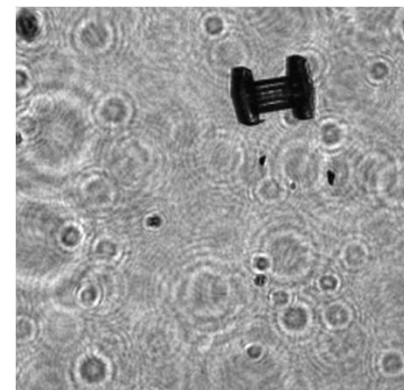
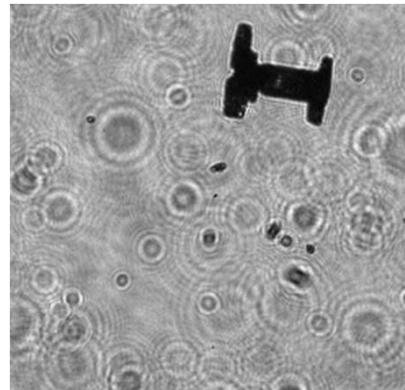
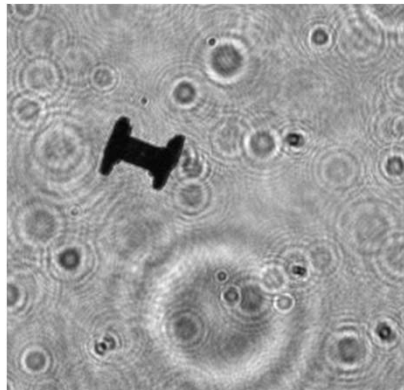


NASA GISS science update: Size-resolved microphysics simulations to understand HIWC



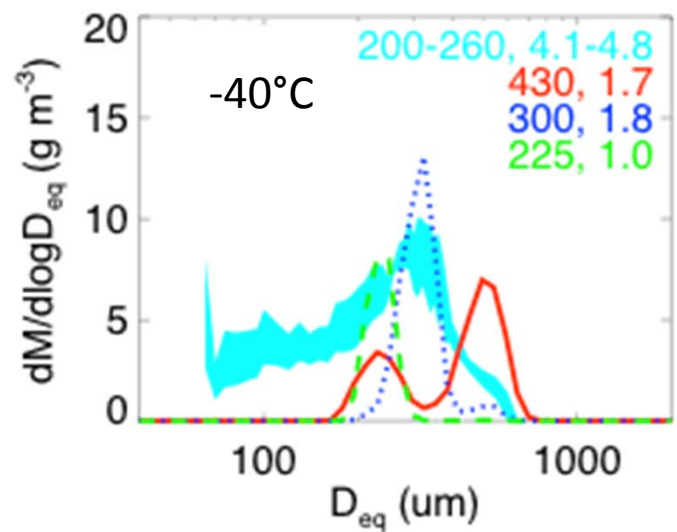
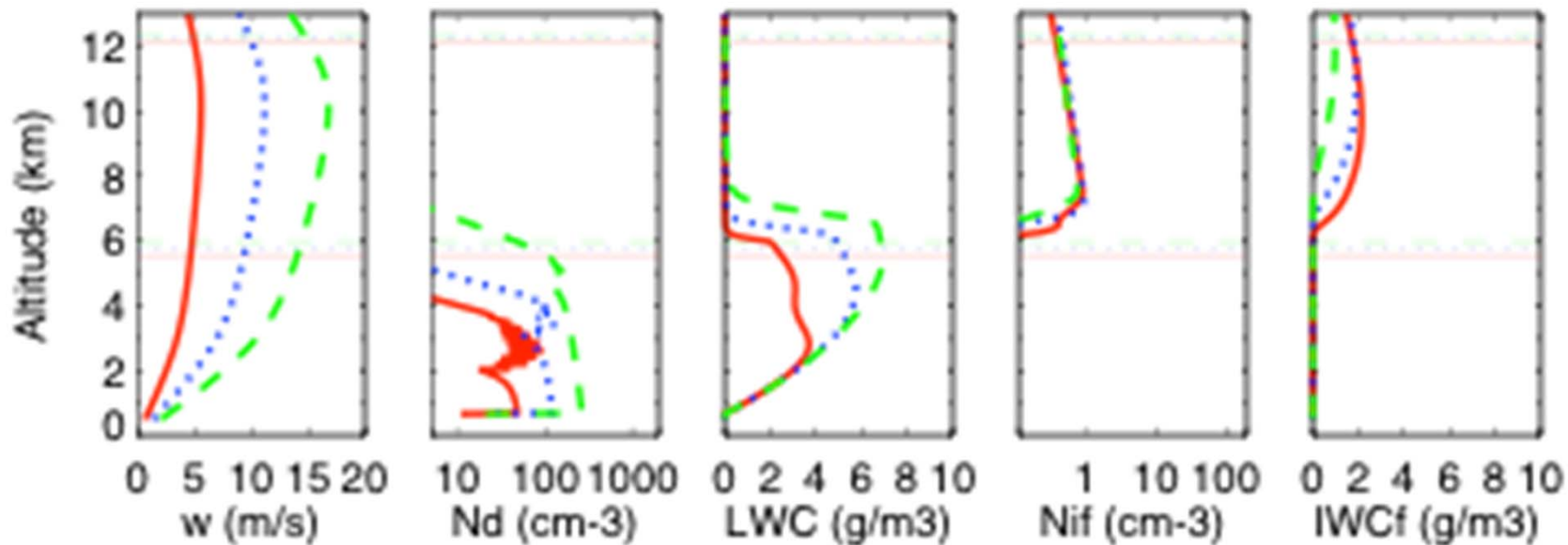
*Ann Fridlind and Andrew Ackerman
NASA Goddard Institute for Space Studies*

2015 HAIC-HIWC Workshop • 9 March 2015 • New York

Column and parcel modeling analysis of 2010–2012 Airbus data set

- High ice water content at low radar reflectivity near deep convection:
Part I. Consistency of in situ and remote-sensing observations
with stratiform rain column simulations
 - A. Fridlind, A. Ackerman, A. Grandin, F. Dezitter, M. Weber, J. W. Strapp, A. Korolev,
C. Williams
 - analysis of in situ data, column simulations of heavy stratiform rain
 - prepared for submission to ACP, circulated to co-authors February 2015
- High ice water content at low radar reflectivity near deep convection:
Part 2. Evaluation of microphysical pathways in updraft parcel simulations
 - A. Ackerman, A. Fridlind, A. Grandin, F. Dezitter, M. Weber, J. W. Strapp, A. Korolev,
C. Williams
 - parcel simulations of updrafts
 - soon to be circulated to co-authors

Parcel modeling update



(1) Conference presentations and papers, reports, and journal articles using HAIC-HIWC data (past, current, and proposed)

- Current presentation
 - Use of observations and simulations to investigate primary microphysical pathways between deep convection updrafts and the stratiform melting level
 - A. Fridlind, A. Ackerman, A. Schwarzenboeck, D. Leroy, W. Strapp, A. Korolev, M. van Lier-Walqui, G. McFarquhar, W. Wu, C. Williams
 - 26th IUGG 2015 General Assembly, Prague, June 2015
 - TBD mixture of HAIC-HIWC flight 23 and MC3E May 20th observations and simulations
- Proposed presentations
 - Analysis of flight 23 observations (April 2015 iLeaps/GEWEX Aerosol-Cloud-Precipitation-Climate Workshop, NASA GISS)
 - Simulations of flight 23 conditions (December 2015 AGU Fall Meeting, San Francisco)
- Proposed journal article(s)
 - Bin microphysics simulations compared with HAIC-HIWC flight 23 data

(2) The data sets we are using, the ones we are waiting for, and any special requirements that our articles will need (e.g. other references)

- Data sets we are using (flight 23)
 - IKP total condensate
 - f20-2014-02-18-205028-IKPV4.csv
 - SAFIRE state variables (temperature, altitude, true airspeed, vertical acceleration)
 - in IKP file, from F20_1Hz-HAIC_base_aipov_v2_20140218_fs140023.txt
 - composite 2DS-PIP ice size distributions (measured number, derived mass)
 - HAIC-HIWC-VOL23-Composite_2DS-PIP_5seconds_v2-RASTA.txt (17-May-2014)
- Data sets we are waiting for
 - C-Pol gridded measurements and retrievals (flight 23, ungridded reflectivity for others?)
 - finalized composite ice size distributions (flight 23, others?)
 - lightning fields (flight 23, others?)
- Special requirements (helpful)
 - sense of where flight 23 fits into remaining campaign data (IKP, dN/dD, state, radar loops)

(3) Any research collaboration ideas you would like to promote within the HAIC-HIWC group

- Interactive analysis of size distribution, image data suited to process studies
 - ice properties analysis/use (maximum dimension, mass, projected area, overall aspect ratio)
 - single-particle data base including maximum dimension, projected area
 - multi-mode size distribution fits
 - characterization of pristine signatures, evaporation signatures
 - degree of riming, fraction of aggregates by size

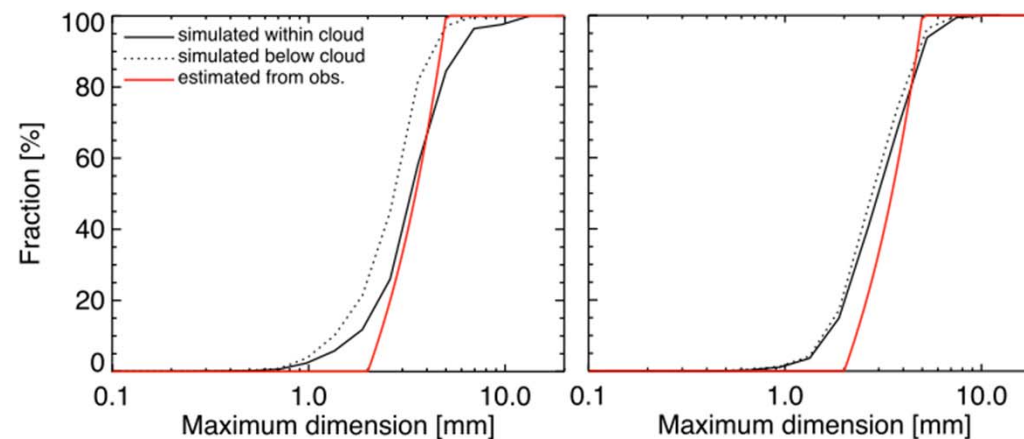


Figure 18. Aggregate fraction in simulations with (left) high and (right) low density dendrites and aggregates and a uniform initial IN profile.

Avramov et al. (2011)