

**GRUAN ANALYSIS TEAM FOR  
NETWORK DESIGN AND  
OPERATIONS RESEARCH**

**GATNDOR STATUS REPORT  
TO GRUAN ICM-3**

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## GATNDOR BACKGROUND

- Created at ICM-1, Norman, March 2009
- Purpose: To perform focused, short-term research to address specific topics identified by the GRUAN science and management community
- Coordination with GRUAN Task Teams
  - Task Teams, created at ICM-2, took on some GATNDOR topics
  - All GATNDOR members are Task Team members/chairs
- Mode of Operation
  - GATNDOR investigators collaborate with relevant experts
  - GATNDOR meets at ICMs and via quarterly phone calls
  - “Deliverables” are scientific publications with useful results

## GATNDOR INFORMATION ON WWW

- Go to GRUAN Home Page (Deutscher Wetterdienst)
  - Click on “Governance”
    - Click on “GATNDOR”
- Includes work plan for 2010-2011
- Some conference call notes

## CURRENT GATNDOR TEAM MEMBERS

- John Dykema - Harvard University (USA)
- Tom Gardiner - National Physical Laboratory (UK)
- Fabio Madonna (incoming chair) – CNR-IMAA (Italia)
- Dian Seidel (outgoing chair) - NOAA (USA)
- Junhong (June) Wang - NCAR (USA)
- David Whiteman - NASA (USA)
- Notes:
  - GATNDOR research includes other collaborators
  - Currently, too few members, too few countries

# FORMER GATNDOR PROJECTS TRANSFERRED TO GRUAN TASK TEAMS

## ○ Scheduling Protocol

- Formerly: GATNDOR Topic 3
- Now: GRUAN Task Team 3: Measurement schedules and associated instrument-type requirements
- Co-chairs: Tom Gardiner & Dave Whiteman

## ○ Network Configuration

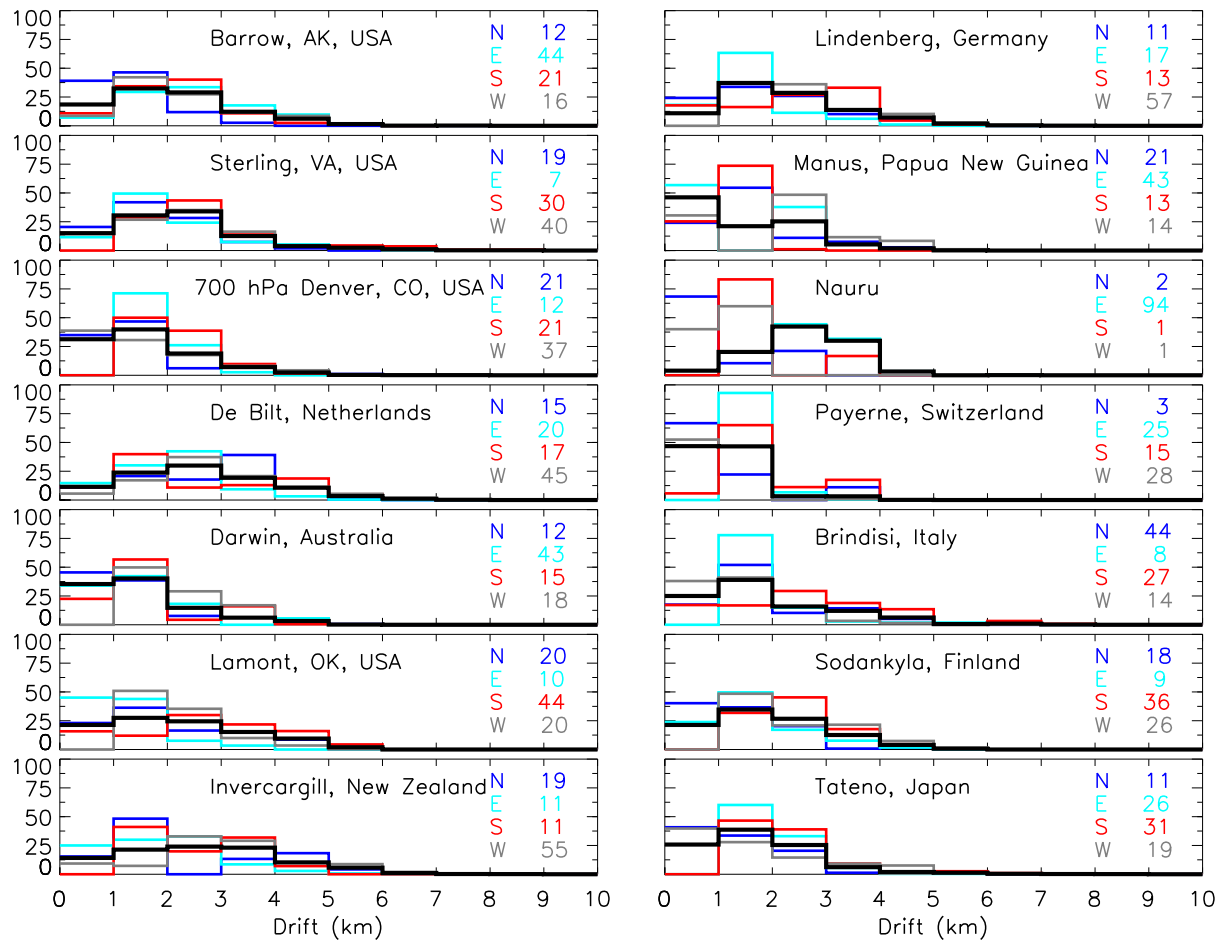
- Formerly: GATNDOR Topic 5
- Now: GRUAN Task Team 4: Site Assessment, Expansion, and Certification
- Co-chair: Russ Vose

# CURRENT GATNDOR RESEARCH TOPICS

- Collocation of Observations
  - Balloon drift climatology
    - Lead: Dian Seidel
    - Reported at ICM-2, brief report here
  - Effects of imperfect collocation on uncertainty budget
    - Lead: Bomin Sun
    - Preliminary report at ICM-2, brief report here
  - Application to GRUAN-specific uncertainty budgets
    - Lead: Franz Immler
    - New focus, will begin after ICM-3
- Management of Change
  - Lead: June Wang
  - Report in this session
- Quantifying the Value of Complementary Observations
  - Lead: Fabio Madonna
  - Report in this session

# BALLOON DRIFT CLIMATOLOGY

## 850 HPA DRIFT DISTANCES AT GRUAN SITES



# BALLOON DRIFT CLIMATOLOGY

## DRIFTPLOTTER INTERACTIVE SOFTWARE

**DriftPlotter -- NOAA/NESDIS/STAR**

File About

Introduction Level Drift Animation Contour

**STAR** Center for Satellite Applications and Research  
formerly ORA — Office of Research and Applications

NOAA Satellite and Information Service  
National Environmental Satellite, Data, and Information Service (NESDIS)

DriftPlotter is a program that displays radiosonde balloon drift data in 3 different ways, each of which is described below. The drift data comes from the NOAA Products Validation System (NPROVS), developed by NOAA/NESDIS/STAR, which collocates radiosonde observations with satellite product systems. The balloon drift information was extracted from the NPROVS data and made available for use with this program. Currently, the date range of the data is from June 2007 through June 2009.

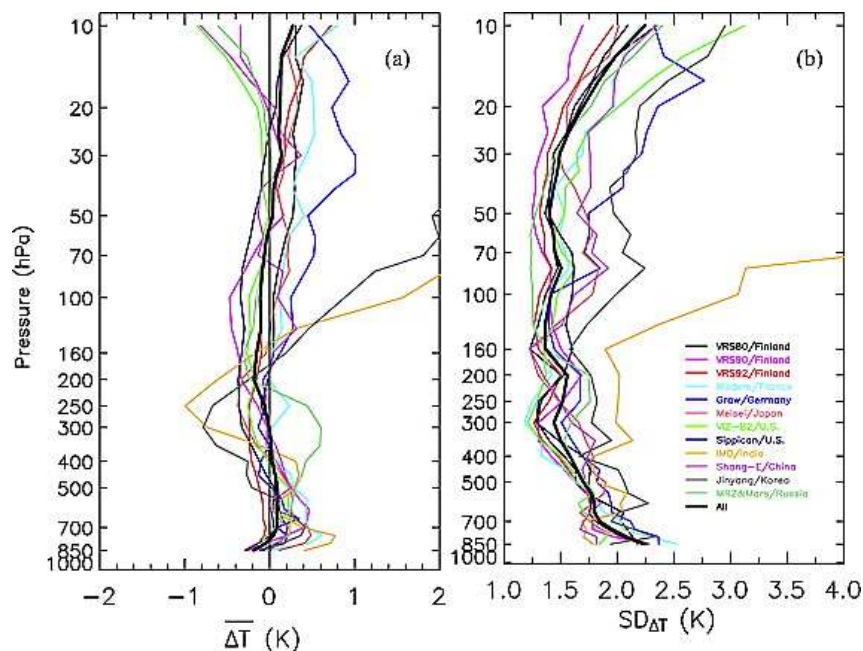
To begin viewing the data, click on any one of the 3 images below or click on one of the tabs at the top of the window. Once you begin, the tabs can be used to switch between each type of display.

Level Drift Locations	Drift Animation	Drift Contour
<p>At selected radiosonde stations, a 2 year sample of balloon locations is displayed at a selected pressure level.</p> <p>Moving the pressure slider up and down will change the display to show the position at the new pressure level. As pressures higher in the atmosphere are chosen, the spread of the balloon trajectories is visualized.</p> <p>The individual balloon launches can be color-coded by season in order to show seasonal trends in drift trajectories and distances.</p>	<p>At selected radiosonde locations, an animation trail of balloon launches is displayed that shows the path taken by each radiosonde.</p> <p>A set of media controls is used to play, pause, speed up and stop the animation. Other controls are available to skip to the next or previous balloon launch or to manually adjust the animation one pressure level at a time.</p>	<p>A global set of radiosonde balloon drift distances is used to create a contour map that shows average drift distances over a 2 year period.</p> <p>Several sets of drift data are available and are divided into final drift (the distance of the balloon at its greatest height), maximum drift (the furthest distance that the balloon drifted from the station), and distances at several pre-defined pressure levels. The data sets are further divided into minimum, maximum and 25th, 50th and 75th percentile distances. Finally, specific seasons can be chosen to view seasonal trends.</p>

- Developed by NOAA/NESDIS/STAR as a tool for GRUAN sites and network design
- Available soon in *J. Geophys. Research*
- Could link from GRUAN web site



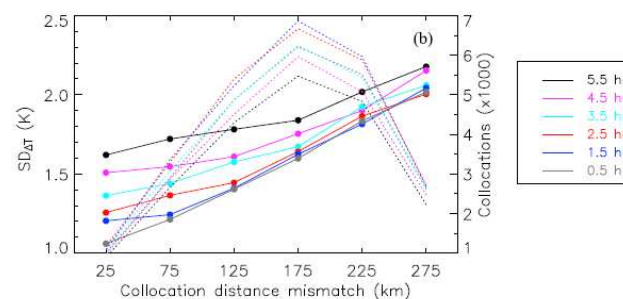
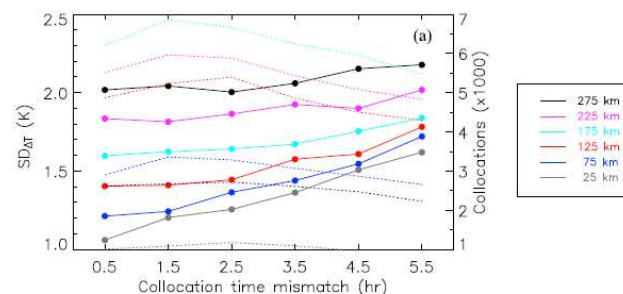
# USE OF “REFERENCE” OBSERVATIONS IN UNCERTAINTY ASSESSMENT



Mean Bias

rms Difference

Comparison of COSMIC and radiosonde temperature profiles  
 Collocation window: 3 hr, 150 km



Effects of imperfect space and time collocation on 300 hPa COSMIC-radiosonde rms differences

# GATNDOR PUBLICATIONS

## ○ Importance:

- Provide peer-reviewed basis for GRUAN decisionmaking
- Document GRUAN science in permanent archives
- Increase GRUAN visibility within scientific community

## ○ Publications to date:

- Sun, B., A. Reale, D. J. Seidel, and D. C. Hunt, 2010: **Comparing radiosonde and COSMIC atmospheric profile data to quantify differences among radiosonde types and the effects of imperfect collocation on comparison statistics.** *J. Geophys. Res.*, 115, D23104, doi:10.1029/2010JD014457.
- Seidel, D. J., B. Sun, M. Pettey, A. Reale, 2011: **Radiosonde balloon drift climatology.** *J. Geophys. Res.*, in press.

# GATNDOR CHALLENGES AND OPPORTUNITIES

- GATNDOR membership
  - A strong but small team
  - Too few countries represented
  - GATNDOR members also involved with Working Group and Task Teams (pros and cons)
  - Seeking student collaborators, but so far not successful
- Support for GATNDOR research projects
  - Currently, no GATNDOR-related research has sustained funding
  - Limited, short-term support, for one project
  - NOAA Climate Program Office call for proposals: Long lead time, significant effort to prepare proposals, difficult for non-US scientists
- Making research results truly useful for GRUAN decision-making – published studies are not the final product

## GATNDOR GOALS FOR ICM-3

- Refine GATNDOR research topics, based on interaction with Task Teams and ICM-3 participants
  - Consider ways to use initial GRUAN data release
- Increase GATNDOR membership
- Begin to develop 2011-2012 Work Plan during breakout session on Wednesday
- Address GATNDOR research support, in context of overall GRUAN support
- Clarify GATNDOR roll in promoting GRUAN within the satellite community

## THANKS TO:

- GATNDOR team members
- Collaborators: Bomin Sun, Tony Reale, Michael Pettey (NOAA), Nico Cimini (IMAA-CNR)
- Franz Immler (DWD), new GATNDOR member
- Fabio Madonna, new GATNDOR Chair