Vol. 3 No. 4, August 2012

RA II Pilot Project Newsletter

DEVELOPING SUPPORT FOR NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES IN SATELLITE DATA, PRODUCTS AND TRAINING

Contents of this issue

2nd Announcement for the 3rd Asia/Oceania Meteorological Satellite Users' Conference

The Korea Meteorological Administration (KMA) and The National Meteorological Satellite Center (NMSC) are pleased to announce the Third Asia/Oceania Meteorological Satellite Users' Conference to take place **from 9 to 12 October, 2012 in Jeju Island, Korea.**

The conference is expected to be of particular interest to experts in the fields of meteorology, climatology and environment-related satellite observation.

The 2nd announcement is posted on the web-site at http://nmsc.kma.go.kr/html/homepage/contents/aomsuc/main.html

The preliminary program, registration, details of VISA support and general information is provided with the second announcement.

Conference Topics

The conference will consist of verbal and

poster sessions with respect to the categories outlined below.

- Current and future meteorological satellite programs
- Facilitation of data access and utilization
- Atmospheric parameters derived from satellite observations
- Application of satellite data to weather analysis and disaster monitoring
- Application of satellite data to numerical weather prediction
- Application of satellite data to climate and environmental monitoring
- Land surface and ocean parameters derived from satellite observations
- Capacity building and training activities

Important Dates

- 15 September, 2012
  Deadline for Registration and VISA application form
- 9~12 October, 2012
  3rd Asia-Oceania Meteorological Satellite Users' Conference

Contact Details

For registration, visa support and hotel bookings, please send the relevant forms to the Local Organizing Committee (LOC). Queries related to the conference itself can also be addressed to the LOC.

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(cc: hyoung0203@korea.kr)

Registration

Advance registration is required for conference attendance and participation in its discussions. This applies to all delegates, including those who have already registered in response to the first announcement. Please note that on-site registration is not possible.

To register, please download the form from the link below and send the completed version to the Local Organizing Committee (LOC).
http://nmsc.kma.go.kr/html/homepage/contents/aomsuc/main.html

The deadline for registration is 15 September, 2012.
There is no registration fee for conference.

For details of the conference, please contact the Local Organizing Committee (LOC). More information could be found at the following web-site:
http://nmsc.kma.go.kr/html/homepage/contents/aomsuc/main.html

(Dohyeong KIM, KMA)

Inter-Calibration of COMS Infrared and Visible Channels

COMS (Communication, Ocean, and Meteorological Satellite) has been fully operating its own missions since April 2011.

The inter-calibration system using COMS for infrared radiation based on the GSICS (Global Space-based Inter-Calibration System) Coordinate Center (GCC) Algorithm Theoretical Basis Document (ATBD). Reference instrument uses the hyperspectral Infrared Atmospheric Sounding Interferometer (IASI) on the low Earth orbit Metop-A satellite. In order to verify infrared channel calibration, COMS and IASI data are selected if meet the collocation matching conditions. Then, IASI radiances are converted into a simulated COMS radiance according to the spectral responses of COMS infrared channels.
In Infrared channels calibrations, the results from April 2011 to March 2012 showed the averages of temperature difference between

COMS and IASI are 0.37K for IR1(10.8μm), -0.46K for IR2(12.0μm), 0.27K for IR3(6.7μm) and -0.22K for IR4(3.7μm) in figure 1. The IR channel inter-calibration implemented using COMS data has been successfully processed for near real-time operation and posting the analysis of the inter-calibrations on a KMA publicly accessible website.

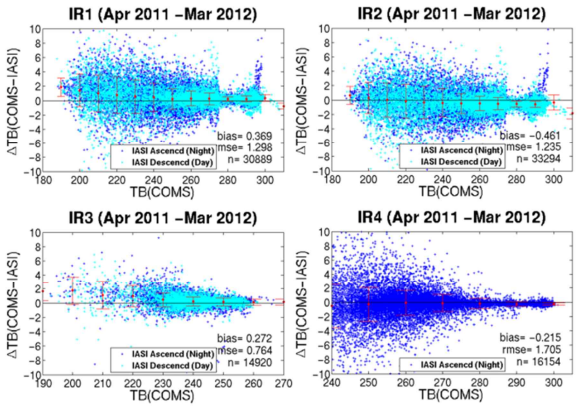


Figure 1 Results of IR channels calibration with IASI

For verifying the visible channel calibration, KMA had established moon-calibration system by developing the method comparing the irradiances between the moon observation data of COMS visible channel and the values from ROLO (Robotic Lunar Observatory) model of USGS as a reference data. For retrieving COMS moon irradiances, we cut the COMS Level 1A data about 1090 X 623 pixels under the consideration of COMS sampling rate 1.75 with the center of the moon. From these reprocessed data, we obtained measured moon irradiance, which were total irradiance of these data, and calculated the ratio of measured irradiance to ROLO model irradiance computed under the same conditions. The results showed that the maximum difference of irradiances between measurement and ROLO model during whole 2011 was less than 4%. The trend of the ratio considered as the degradation ratio of COMS visible channel is about 2% during the period from Feb 2011 to May 2011.

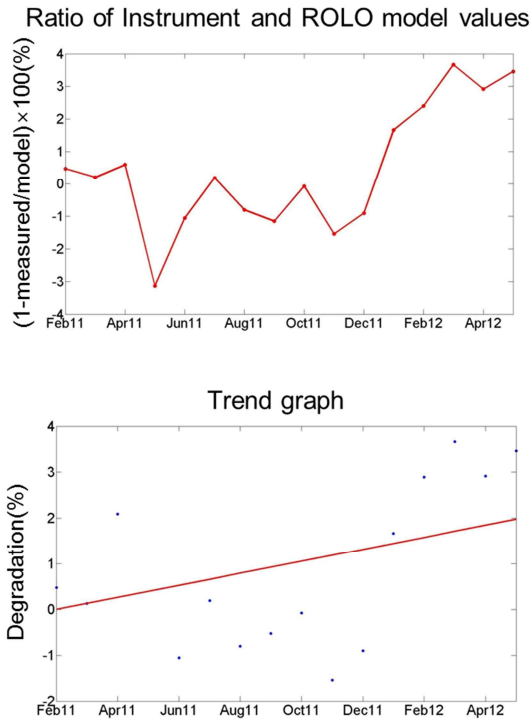


Figure 2 Results of Moon calibration

(Wonseok Lee & Hoseung Lee, KMA)

CMA held the International Training Course on McIDAS-V Software Application in Satellite meteorology

CMA held the International Training Course on McIDAS-V Software Application in Satellite Meteorology, 11 June,2012, Beijing.

Jointly sponsored by China Meteorological Administration (CMA) and CMA Training center (CMATC), the International Training course on McIDAS-V Software Application in Satellite Meteorology was successfully organized by CMATC from 11 to 21 June 2012 in Beijing. In the morning of June 11, Ms. JIAO Meiyan, Deputy Administrator of CMA, made a welcome speech at the opening ceremony.

This 11-day training course is designed to help trainees to learn how to use the sophisticated software packages of McIDAS (Man Computer Interactive Data Access System) to acquire, display, analyze, interpret, and manage the geophysical data, such as satellite and radar imagery, real time observational reports, and gridded numerical forecasts, so as to improve the application and analytical skills in the satellite data interactive processing technology, to enhance the problems-solving capability in the application process and to boost the McIDAS research for participating countries. Three McIDAS professionals from University of Wisconsin, U.S.A, were invited to give lectures on McIDAS. Meanwhile, top experts in Chinese meteorological satellite fields taught related knowledge on FY meteorological satellites.

The training course provided an opportunity for trainees of all backgrounds to broaden their knowledge and technology of satellite through first-hand experience in carrying out satellite data analysis. Participants from developing countries, who are engaged in meteorological satellite operation and research management, got professionally trained.

On 21 June, the course came to the conclusion. 18 trainees from 15 countries actively involved in the closing ceremony, all the trainees representing their own country and their Service expressed gratitude towards CMA and CMATC. They thought the course is well organized and expected to come again for further study in China.

All participants for this Course are in the field of software engineering and satellite meteorology, respectively from Uzbekistan (1), Malaysia (1),Korea (2), Namibia（1）, Rwanda（1）, Zimbabwe（1）, Zambia（1）, Indonesia（1）, Kenya（1）, Mongolia（2）, Pakistan(1),Thailand (1), Sierra Leone（1）, South Africa(1), Libya(1), Yemen (2).

As WMO Regional Training Centre Beijing,

and as the Center of Excellence WMO/CGMS Virtual Laboratory, CMATC has hosted 4 meteorological satellite international workshops in the past. All of them have achieved great success and gained high appraisals and support from the participants. These successes are closely related to the encouragement and support of superior manager in Department of International Cooperation of CMA and CMATC.

In the next half year, CMATC will host International Training Course on Nowcasting (3-14 September), International Training Course on Regional Climate Prediction and Drought Monitoring and Warning(17-27 September) and Training Seminar on Application of Meteorological Satellite in Disaster Risk Reduction and Environment (22 October-2 November). These three courses are now open to accept nominees from all the developing countries.

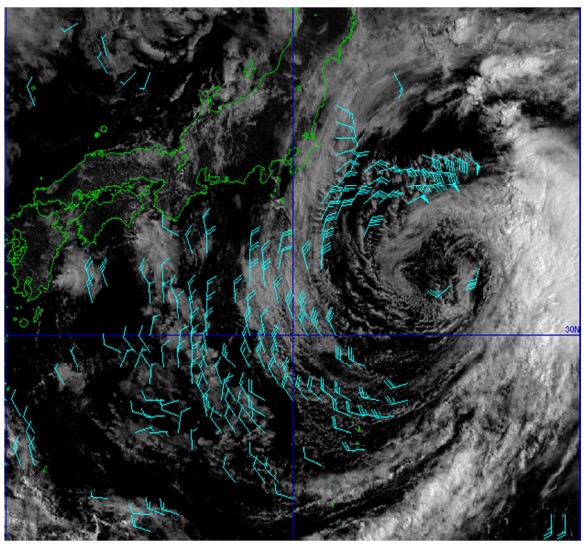
From 16 to 20 July, Dr. Jeremiah Lengoasa, Deputy Secretary-General of WMO, paid a visit to CMA. In the interview by China Meteorological News Press, Dr. Jeremiah Lengoasa acknowledged CMA's unremitting work and noticed with satisfaction and respect, of CMA's contribution on meteorological science development. He also hoped that WMO and CMA could enhance bilateral cooperation in many ways, such as integrated observing system, seamless forecasting and regional training. 'Our improvement depends largely on scientific and technological development. CMA has gained opportunities today to invest to build ground stations for satellites,' he said. In fact, CMA is not only making the satellites images available but also holding international trainings. A certain number of foreign participants have been trained by CMA through participation into many courses.

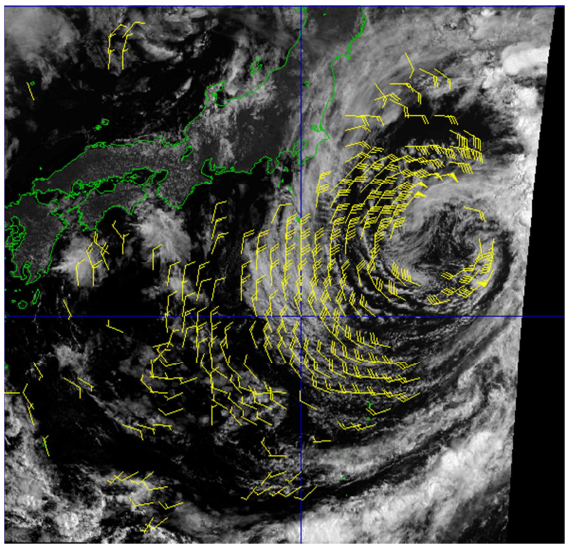
(Ms. CHEN Jinyang, Ms. GAO Feng
CMA Training Centre,
Email: chenjy@cma.gov.cn)

Rapid Scan AMVs in the Vicinity of Typhoons

The Meteorological Satellite Center (MSC) of the Japan Meteorological Agency (JMA) produces Atmospheric Motion Vectors (AMVs) on an hourly basis from operational MTSAT-2 data (Oyama 2010). In addition to hourly wind information, AMVs based on images taken at five-minute intervals using MTSAT-1R's rapid-scan function are also produced at MSC/JMA. Rapid-scan operation helps to clarify the mechanism behind severe weather phenomena, which usually have a short lifetime. As an example, cloud systems in the vicinity of typhoons tend to deform quickly, meaning that only high-temporal-resolution images can capture them. Figure 1 shows MTSAT-2 hourly AMV data (left) and MTSAT-1R rapid-scan AMV data (right) based on visible images of the area around 2011's Typhoon Ma-on. There are more rapid-scan AMVs than hourly AMVs because rapid scanning allows tracking of short-lifetime clouds.

(a)





(b)

Figure 1. Low-level cloud-drift winds in the vicinity of Typhoon Ma-on at 00 UTC on July 23, 2011. (a) MTSAT-2 hourly AMV and (b) MTSAT-1R rapid-scan AMV based on visible images of the area around 2011's Typhoon Ma-on

Sea surface wind data from the Metop-A satellite's ASCAT instrument is currently utilized as auxiliary wind information for JMA's typhoon warning service. Although the quality of these data is good for typhoon analysis, Metop-A is a polar-orbiting satellite, meaning that observation is occasionally sparse. Against this background, the ability to estimate sea surface winds continuously from rapid-scan low-level AMVs derived every five minutes will enable the creation of a useful dataset for the typhoon warning service. JMA compared AMV and ASCAT wind data to investigate the validity of rapid-scan AMVs for typhoon analysis. Below is an outline of a case study involving MTSAT-1R rapid-scan AMVs around Typhoon Ma-on.

Figure 2 shows the relationships between wind speeds derived from MTSAT-1R rapid-scan images and ASCAT data around Typhoon Ma-on. Comparison between AMV and ASCAT wind data was conducted for the area within 1,000 km of the typhoon's center. The figure on the left shows wind speed differences, and that on the right shows wind direction differences between ASCAT and MTSAT-1R AMV data. It can be seen that ASCAT wind speeds tend to fall on a line described by 0.8 × AMV wind speed. In terms of wind direction, ASCAT wind data show a tendency to lean +10 degrees toward the typhoon center with AMV data as a reference. These tendencies may be caused by friction force in the planetary boundary layer (Dunion and Velden 2002).

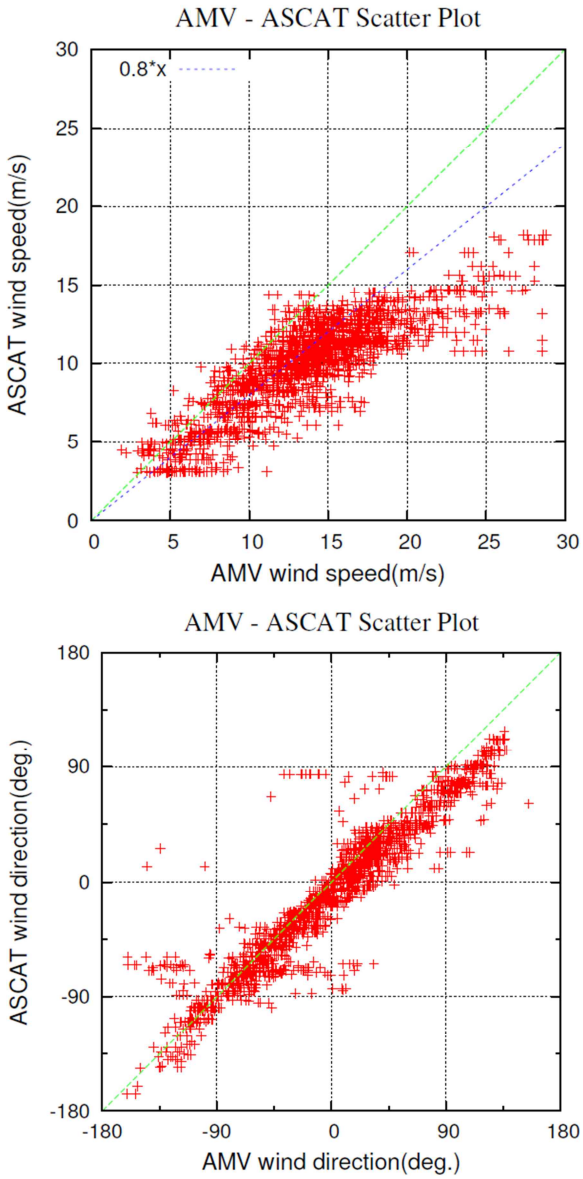


Figure 2. Scatter plots of MTSAT-1R rapid scan wind and ASCAT wind data. The statistical period is from 17th to 23rd July, 2011

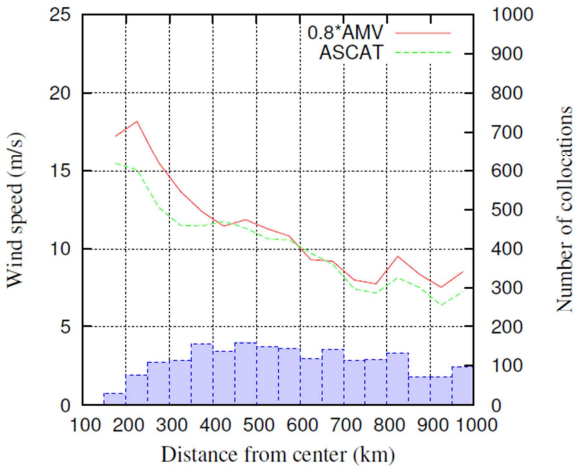


Figure 3. Collocated wind speed profiles from the typhoon center

Figure 3 shows the relationships between wind speed and the distance from the observed wind to the typhoon center. The blue bins indicate the number of collocations. It can be seen that AMV wind speed (the red solid line) trends closely match ASCAT wind speeds (the green dashed line), although the former are higher within 100 – 400 km of the typhoon center where the actual wind speed is considered to be high. This tendency probably originated from ASCAT's slow bias in the high-speed regime (Roger 2010) or the complexity of wind speed's vertical profile around typhoons.

(Masahiro Hayashi, JMA)

References

Dunion, J. P. and C. S. Velden, 2002: Application of Surface-Adjusted GOES Low-Level Cloud-Drift Winds in the Environment of Atlantic Tropical Cyclones. Part I: Methodology and Validation, Mon. Wea. Rev., 130, 1333 – 1346

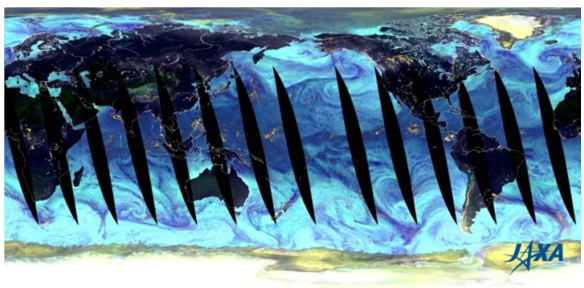
Oyama, R., 2010: Upgrade of Atmospheric Motion Vector Derivation Algorithms at JMA/MSC, Meteorological Satellite Center Technical Note, 54, 1 – 32

Roger, T. E., 2010: Life after QuikSCAT-Tropical Cyclone Analysis Using Microwave Imagery and Data, Proceedings of the 29th Conference on Hurricanes and Tropical Meteorology

SHIZUKU Observation Data Acquired by AMSR2

The Japan Aerospace Exploration Agency (JAXA) has released some observation images on the Earth acquired by the Global Change Observation Mission 1st - Water "SHIZUKU" (GCOM-W1). The SHIZUKU was launched from the Tanegashima Space Center at 1:39 a.m. on May 18, 2012 (Japan Standard Time) and entered into the A-train orbit on June 29, then has started regular observations since July 3, after increasing the antenna rotation of the onboard Advanced Microwave Scanning Radiometer 2 (AMSR2) to 40 rpm.

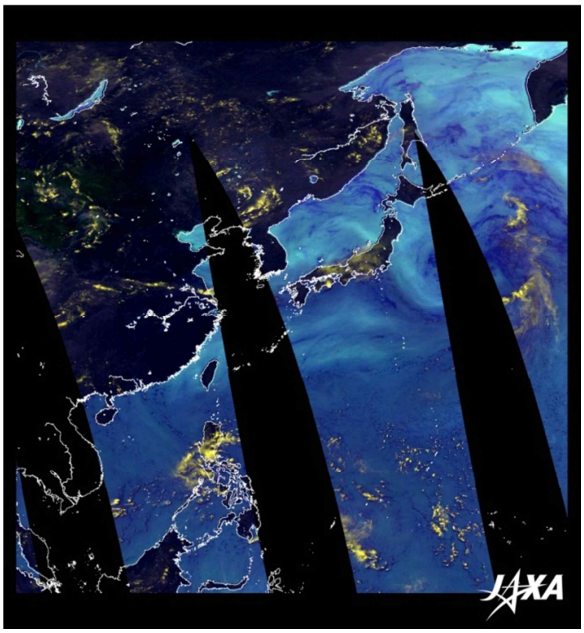
Figure 1 is a one-full-day observation image of the Earth by the AMSR2 aboard the SHIZUKU from 9:00 a.m. on July 3 (JST) to July 4. In this image, whitish-yellow color parts indicate areas with heavy rain or sea ice, light blue color areas are with little water vapor in the atmosphere or thin clouds, the dark blue color sections are areas with more water vapor in the atmosphere or thicker clouds, and the black color parts are areas that were not observed.



(Figure 1)

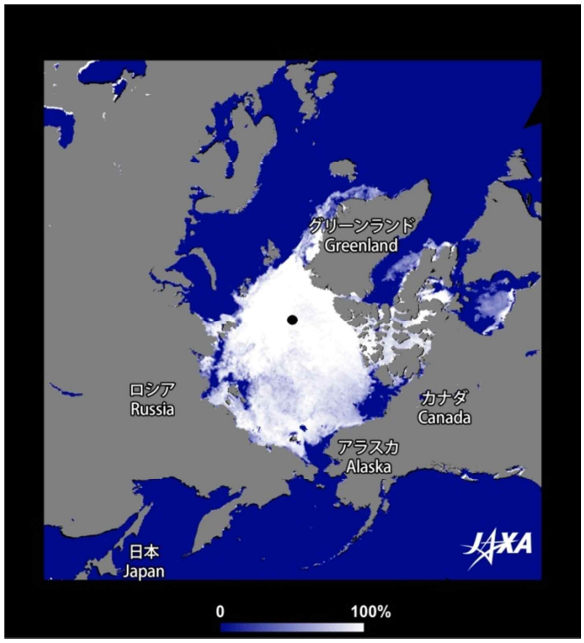
Figure 2 is a close-up view around Japan cut out from Figure 1. The SHIZUKU flew over Japan around 1:00 p.m. on July 3 (JST). At that time, a rain front remained over Japan, and the image shows whitish-yellow color parts, which indicate areas with heavy rain, over wide areas of the eastern part of Shikoku Island, and the Kinki and Tokai regions. Also, there was a low pressure system over the sea on the east of Japan, and the whirly pattern in

light to dark blue colors corresponds to the distribution of water vapor and clouds in the atmosphere.



(Figure 2)

Figure 3 shows the distribution of sea ice concentration during July 3-4, 2012 (JST). Since the SHIZUKU flies over the Polar Regions many times (every 100 minutes) in a day, the entire area of the Arctic Ocean can be observed daily. In the image, white indicates areas covered by ocean ice, blue is sea areas, gray is land, and black areas were not observed. The Arctic sea routes are drawing a lot of attention in recent years. Through our observations we can see that we have already lost some sea ice in the ocean on both the Northeast Passage along the Russian Arctic coast and the Northwest Passage on the Canadian and Alaskan coasts.



(Figure 3)

JAXA will continue the initial functional verification (for about three months after launch,) then confirm data accuracy by comparing it with observation data acquired on land, and perform initial calibration and inspection operations including data correction.

(Kenji Imaoka, JAXA)

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From the Co-editors

The co-editors invite contributions to the newsletter. Although it is assumed that the major contributors for the time being will be satellite operators, we also welcome articles (short contributions of less than a page are fine) from all RA II Members, regardless of whether they are registered with the WMO Secretariat as members of the Pilot Project Coordinating Group. We look forward to receiving your contributions to the newsletter.

(*Toshiyuki KURINO, JMA, and Dohyeong KIM, KMA*)

RA II Pilot Project Mailing Lists

Two mailing lists for discussion on the pilot project will soon be set up using the Google Groups service, and will be implemented either through the Google Groups web interface or by e-mail.

One list is for Pilot Project Coordinating Group members who are already registered with the WMO's Regional Office for Asia and the South-West Pacific.

Group name: ra2pp_sat_cg
Group home page:
http://groups.google.com/group/ra2pp_sat_cg
Group email address:
ra2pp_sat_cg@googlegroups.com

The other list is for RA II Members in general.

Group name: ra2pp_sat
Group home page:
http://groups.google.com/group/ra2pp_sat
Group email address:
ra2pp_sat@googlegroups.com

RA II Pilot Project Home Page

http://www.wmo.int/pages/prog/sat/ra2pilotproject-intro_en.php

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