# IVS Newsletter

Issue 32, April 2012

## VLBI2010 Technical Specifications Workshop Held

*– Dirk Behrend, NVI, Inc./NASA GSFC*

*Participants at the VLBI2010 Workshop on Technical Specifications held in Bad Kötzting, Germany.*

It was in early March that the misty mountains of the Bavarian Forest saw the beginning of a new dawn. At the venue of the 1st IVS General Meeting in Bad Kötzting/Wettzell, BKG and TU Munich played host to a crowd of almost 100 people attending the VLBI2010 Workshop on Technical Specifications (TecSpec). The workshop was organized by the VLBI2010 Project Executive Group (V2PEG) and the VLBI2010 Committee (V2C) on 1−2 March 2012. TecSpec was tailored towards the station side of VLBI2010 and thus focused almost exclusively on the station specifications and hardware. Items covered went from the fast-slewing antennas to wideband feeds and front-ends to back-ends and recorders. Additional topics included e-transfer and e-VLBI, monitor and control, and clock distribution.

*The shroud of mist gave the newly constructed TTW a venerable ambience. The participants paused in awe once the fast slewing telescopes appeared out of the mist on their approach up the hill.*

TecSpec brought together experts in VLBI2010 technology with station managers and engineers in order to provide a better understanding of the VLBI2010 concept from the technical point of view. The workshop was timed in conjunction with the 7th IVS General Meeting, which was held the subsequent week in Madrid, Spain (see pages 4+5). This allowed participants coming from overseas or the antipodes to Europe to attend both events in rapid succession. The choice of venue also allowed a visit to the newly constructed Twin Telescope Wettzell (TTW) providing a glimpse of what the future of geodetic VLBI may look like.

The program of the workshop consisted of a number of invited lectures (about 20) by VLBI2010 experts as well as contributed poster presentations (about 25) by the experts, station managers, and commercial suppliers. The lectures were given over the first 1.5 days and included an allowance for questions and comments from the audience. The poster session augmented the first day of lectures and was an excellent forum of exchanging experience in a more informal manner. The final half-day was reserved for the station visit. The entire lecture material plus about half of the poster presentations as well as additional information are available on the meeting Web page at http://www.fs.wettzell.de/veranstaltungen/vlbi/tecspec2012/ and the VLBI2010 pages of the IVS Web site at http://ivscc.gsfc.nasa.gov/technology/vlbi2010-general.html.

The general response to the workshop was very positive, first of all manifesting itself in the large attendance number, but also based on the feedback given on site. The collaborative spirit and the enthusiasm for moving forward were almost tangible. Of course, nothing is perfect and there were some concerns and requests. The foremost concern was with regards to RFI, which resulted in the action item to review the RFI environment at station locations to determine, for instance, whether the inclusion of the S-band frequencies in the broadband VLBI2010 system is realistic. A plan is being developed to measure and monitor the RFI environment at all station locations.

The big success of the TecSpec workshop was not least due to the organizational skills of our Bavarian hosts. Hence, a big thank-you goes to the Wettzell crew for giving us hospitality and gemuetlichkeit.

# Feature

## NASA Goddard Space Flight Center

*NASA Goddard Space Flight Center (GSFC) supports several components of the IVS and provides vital functions for the service such as the Coordinating Center and the Network Coordinator. The strong support of VLBI is historically grown dating back to the early 1970s. Newsletter editor Hayo Hase tapped into the knowledge base of Goddard's council of elders by interviewing Chopo Ma and John Gipson.*

*Chopo, please tell us about the early days of VLBI at GSFC? What are the reasons that VLBI was, and continues to be, of interest to NASA as a space agency?*

The earliest days of VLBI at GSFC in the mid-1970s were full of anticipation since neither the NASA data acquisition systems nor the analysis software was in hand. The group under Tom Clark and Jim Ryan had the luxury of developing benchmarks like CALC and the data base handler before the inundation of real data but faced limitations like a minicomputer with only 32k of memory, mostly occupied by the operating system. NASA's interest at the beginning was the measurement of real-time tectonic plate motion and deformation in fault zones to provide data for earthquake forecasting, but the application to monitoring Earth rotation was also recognized. Now NASA is focusing on the fundamental importance of accurate reference frames and precise Earth orientation to support Earth system science, orbit determination and spacecraft navigation, and VLBI makes unique contributions to these measurements.


*The Goddard VLBI Group on the day of the Shuttle Discovery Fly-over over GSFC.*

*How did you become part of the VLBI group and what were your first duties?*

I joined the Goddard VLBI group while still a graduate student when it was formed in 1974. In fact, I had prior contacts with Tom Clark because my roommate was one of his students in the University of Maryland astronomy program using VLBI to map 3C273B. Tom took me on when my previous VLBI work at Goddard was terminated. My duties were to work with Jim Ryan to develop the analysis and data base software.

*Which IVS components does Goddard host? Who does what? Do you have meetings which everyone attends?*

The VLBI group at Goddard has been a continuous team activity since the beginning of geodetic VLBI and a major contributor to the foundation and functioning of the IVS. We should thank Nancy Vandenberg for setting the proper course through her leadership of the IVS Coordinating Center and the on-site VLBI contracting company at Goddard. NASA relies on non-government personnel for most aspects of its support of IVS including the Coordinating Center, Network Coordinator, Operations Center, Analysis Center, and Technology Development Center. Each week there is a meeting of the full Goddard VLBI group to review the recent activities.

*As Mr. ICRF2, how important is the IVS for this primary celestial reference frame? Which problems must be addressed to create a superior ICRF3?*

Although the first ICRF was adopted by the IAU before the start of the IVS, the IVS is recognized by the IAU as the key organization for the data acquisition and analysis required for the ICRF in the microwave domain. For ICRF3 to be a significant improvement over ICRF2, the skewed data distribution must be remedied by enhancing CRF observing in the Southern Hemisphere. This is potentially possible using the new telescopes in Australia and New Zealand. The southern CRF observing program would be greatly strengthened if suitable VLBI stations could be built in Argentina, South Africa, and Tahiti.

*Reviewing the four decades of VLBI at Goddard, what have been the biggest achievements and what challenges remain?*

The greatest achievements of VLBI at Goddard have been to oversee the first generations of geodetic data acquisition systems, to develop a comprehensive analysis system, to use the hardware and software tools to demonstrate current day global and regional geodynamics, to pioneer the radical concept and realization of an extragalactic celestial reference frame, and to provide a strong foundation in the IVS for future VLBI development. The immediate challenge is to build and demonstrate the VLBI2010 system to upgrade aging stations and expand the network to meet ever more exacting requirements.


*The young Chopo Ma (center) handling Mark I tapes for a relativity test at NRAO's Green Bank observatory in 1972. Read more about the beginnings of VLBI in the next Newsletter issue.*

*By the end of the day, what do you do in your leisure time?*

Traveling with my family is something I enjoy in anticipation, in progress, and in memory—whether a short drive to New York for museums and a Broadway show or an extended trip to Hong Kong, Taiwan, and Japan.

*John, you have been the President of NVI, Inc., NASA's main contractor for VLBI. Can you tell us how NVI became involved in the NASA VLBI program?*

To understand how NVI became involved with NASA, you need to know a little history. Since its inception, the Goddard VLBI group relied heavily on contract scientists. As former students of Tom Clark, both Nancy Vandenberg and Chopo Ma joined the Goddard VLBI group. Chopo became a government worker, while Nancy became a contract scientist working for a small company called Phoenix. In the early 1980s, Ed Himwich also joined Phoenix. Shortly thereafter Nancy, Ed, and four other people formed Interferometrics, Inc to focus on providing VLBI support to NASA. In the mid-1980s, Cynthia Thomas and myself, and later Dan MacMillan, joined Interferometrics. During the 1980s Interferometrics began pursuing other business, and in 1991 NVI, Inc was spun off of it. NVI was owned 100% by Nancy Vandenberg and focused entirely on VLBI. In 1991, NVI bid on and won the contract to provide support to the Goddard VLBI group, and it has done so for all follow-on five-year contracts ever since. When Nancy decided to retire in 2003, Ed, Cynthia, and I bought the company from her.

*NVI provides personnel to the Goddard VLBI group and hence the IVS. Can you list the key functions that NVI supports?*

It is probably easiest to list our staff with some of their main activities and contributions in tabular form. Everyone is very busy—some would say too busy.

| | |
|---|---|
| Ed Himwich | IVS Network Coordinator. Station Support. PC Field System. |
| Dirk Behrend | IVS Coordinating Center Director. IVS Secretary. IVS Annual Report and General Meeting Proceedings. |
| Cynthia Thomas | IVS Master Schedule. Coordination. R1 schedules |
| David Gordon | Calc. ICRF2. Analysis of sessions. Scheduling and analysis of RDV experiments. K/Q work. |
| Karen Baver | Assist with IVS Annual Report and GM proceedings. Analysis of sessions. |
| Dan MacMillan | VLBI technique improvement. Data Combination. |
| Sergei Bolotin | Development of new VLBI analysis package. Analysis of sessions. |
| Karine Le Bail | Use of met data in VLBI. Analysis of time series. Statistics. |
| John Gipson | Maintain sked. Technique improvement. New data format. Boss. |

*We know most of your staff as very dedicated. Would it not be easier for NASA to hire your employees directly?*

I hope not, or I would be out of a job! Seriously, this is really a question for someone in the government. I suspect if they knew at the start how long VLBI would be around they would have made many of us government employees.

*Much work was put into the new data format. Can you summarize the advantages and when it will become officially the standard for all geodetic and astrometric VLBI data of the IVS?*

The key idea behind the new data format, which is called openDB, is that data will be stored in netCDF files organized by an ASCII 'wrapper' file, which specifies where the data is. This has the following advantages: large netCDF user community, open source, machine and platform independent, fast and compact, flexible, and shareable. This format should become the official format for exchanging data by the end of 2012. We are in the process of modifying the Calc/Solve software to use the new format. The Vienna analysis software VieVS can already use the new format. Thomas Hobiger and Oleg Titov are modifying their analysis packages to use the new format. Once these are all done, we will have achieved critical mass.

*How and when did your personal career in VLBI start?*

I received a PhD in Theoretical Particle Physics in 1982 and spent a couple of years as postdoc and Assistant Professor of Physics at Virginia Tech. At about that time they were running out of interesting experiments to do with the particle accelerators currently available and were beginning to think about the next generation of machines. I went to a conference where a speaker said "if we start work on this tomorrow, the machine will be ready in 20 years." This was too long for me to wait and I started to look for other jobs. During college I had a summer job at NASA with someone who knew Nancy Vandenberg, and they suggested that I send her a resume. I did so and started working in VLBI at Goddard in 1985.

*What do you admire in VLBI?*

That is really easy—the people. I don't think you can find a friendlier and nicer group of people in any profession. Tom Clark likes to talk about the "VLBI family" and I think that is a good description. The community is small enough that almost everyone knows everyone, and most people are more than happy to help.

*When you are not active in VLBI or busy with NVI, what is your main interest in leisure time?*

I am an avid player of an oriental strategy game that is 3000 years old called "Go" (Japanese), "Wei Chi" (Chinese), or "Baduk" (Korean). One of the things I like about Go is that the more you study, the more there is to learn. It is a very subtle game. Often when I am traveling and will be someplace a few days, I will look up the local Go club and play some games.

## GM2012 – The Best IVS General Meeting to Date?

*– Ron Curtis, ITT Exelis (Kokee Park Geophysical Observatory)*

*Author Ron Curtis during the poster session.*

Many of us traveled to Madrid for the 7th IVS General Meeting (GM2012) from Germany following the very successful VLBI2010 Technical Specification Workshop in Bad Kötzing. We arrived in Madrid on March 3rd on what turned out to be some very pleasant sunny weather for the entire week of activities and events of GM2012. My travel group was lodging at the Hotel Agumar and upon arrival at the Madrid-Barajas Airport we entered into a debate on the travel options to get to the hotel that culminated in a friendly competition on the fastest travel method from the airport to Hotel Agumar—with the options being taxi cab, Metro system, and bus line. Those that opted for sharing a taxi arrived at the Hotel Agumar 20 minutes ahead of the Metro and bus riders. While the taxi riders made good time they missed out on an opportunity to experience some of the rich culture and charm that Madrid has to offer as seen from the local Metro and bus transit systems. After settling in at the hotel, we ventured out on Saturday evening and Sunday morning to do some site seeing at the nearby museums and sidewalk cafes.


*The local organizers from IGN Spain did an excellent job in organizing a very successful meeting.*

The 7th IVS General Meeting officially got underway on Sunday evening with the registration and icebreaker at the reception area and historical venues of the Royal Observatory of Madrid. There were many familiar faces from the IVS community in an evening filled with handshakes, hugs, and countless conversations among colleagues... back at Kokee Park we call this "talking story."

The meeting sessions opened on Monday morning with a Welcome and IVS Chair report by Harald Schuh that recapped significant VLBI progress and events over the past few years that led up to the theme of the GM2012, "Launching the Next-Generation IVS Network." Harald ended his report with a statistical slide that showed the diverse global representation at the General Meeting with approximately 150 participants from 25 countries representing 65 institutions submitting 120 abstracts delivering 60 oral presentations and 50 poster presentations.

The presentations over the next several days covered a broad spectrum of topics that were well organized into sessions on:

1. The Next-Generation IVS Network and VLBI2010 Technology Developments
2. Correlators, Stations, and Operation Centers
3. Advances in Software Development, Analysis Strategies and Data Structures
4. Results in Geodesy, Astronomy and Geophysics and Their Interpretation
5. VLBI Analysis and Results from the Recent Earthquakes in Japan and Chile

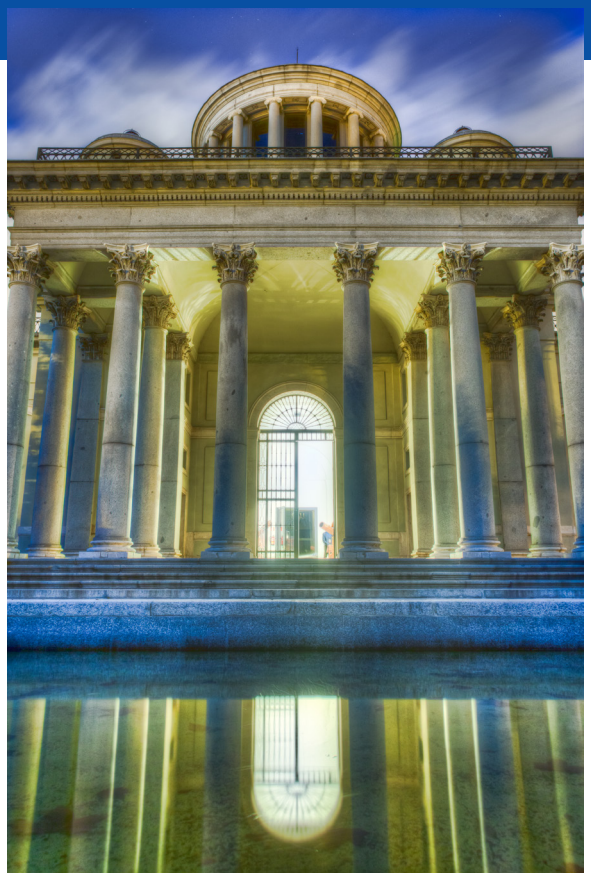
I found all of the presentations interesting and have taken the opportunity to re-read several of them after they were all uploaded to the meeting Web site. There were some underlying themes that were apparent in many of the presentations including methods and approaches to tie various geodetic techniques together and IVS outreach. Several discussions focused on multiple technique combinations and alignment. The "outreach" theme spanned from specific GGOS Outreach to a more general global outreach in seeking assistance in solving local IVS related issues. While most of the presentations focused on the technical aspects, Line Langkaas from Norway delivered an interesting presentation on the economic and political efforts that they experienced in the project to upgrade Ny Ålesund to a core network station.

In addition to the four days of session presentations, many found the conversations before and after the sessions as well as during breaks over some excellent "café con leche" to be a significant added value. Having such a large representation of the global IVS community in the same time zone facilitated numerous ad hoc collaborative discussions on the future directions of VLBI as a whole. It seemed like all of the attendees took advantage of any opportunity they could find to discuss aspects of VLBI as it pertained to them with the "think tank" of expertise present at GM2012.


*The 7th IVS General Meeting gets underway with the reception and icebreaker.*

# News...

On Wednesday afternoon we were all treated to a well coordinated trip to the Yebes Observatory that began and ended with a bus ride at the Hotel Agumar. While at the Yebes Observatory, the mystery of the colored paper attached to the back of our conference badges was revealed. We were divided into groups based on the colored paper to tour all the locations at Yebes in manageable group sizes. We got to experience firsthand the latest geodetic activities in progress at Yebes and took the opportunity to learn from the knowledgeable Yebes staff members.



Upon our return from the Yebes Observatory we had a brief time to freshen up before we made our way on foot to the Restaurante Samarkanda for the conference banquet. There was a lighter atmosphere at the banquet as everyone seemed to relax a little while enjoying a good meal and each other's company for a few hours. The evening ended with a meandering walk back to the hotel on a beautiful Madrid night.

GM2012 concluded on Thursday afternoon with a closing presentation by Harald Schuh in which he presented the new acronym for the next generation VLBI network: "VGOS" (VLBI2010 Global Observing System). The consensus from all the conference attendees was that the 7th IVS General Meeting was the best general meeting to date.

The 13th IVS Analysis Workshop took place on Thursday afternoon following GM2012. As a bystander at this meeting, I listened in on the discussions on how to improve upon the technical analysis and communications practices across the IVS correlators, operation centers, and stations. The IVS Directing Board meeting was held on Friday to officially close out the IVS activities scheduled for the week.

It was a productive, enjoyable, and memorable week in Madrid that truly was the best general meeting to date in moving forward on launching the next-generation IVS network. Aloha and mahalo until the 8th IVS General Meeting in Shanghai, China in 2014.

*Familiar faces as the IVS community gathers for GM2012. (right) Numerous opportunities to interact with colleagues during breaks and the poster session.*

*GM2012 attendees I had the pleasure of dining with at the banquet: (from left) Richard Porcas, Chet Ruszczyk, Elena Skurikhina & Nataliya Zubko.*

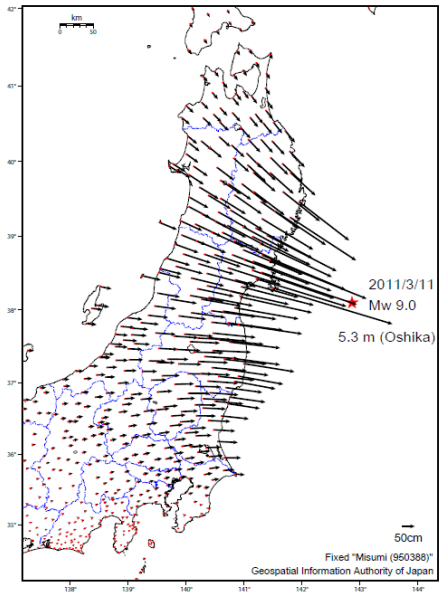
*If you look closely you can see Bill Petrachenko on the platform of the 40m antenna at the Yebes Observatory.*

# NEWS...

## The Tohoku Earthquake: One Year After

*– Shinobu Kurihara, GSI; Dan MacMillan, NVI, Inc./NASA GSFC*

One year has passed since the Tohoku megaquake hit eastern Japan. In the quake-stricken area, huge heaps of rubble still remain and people who had lived within 30 km of the Fukushima nuclear power plant had to be relocated due to the reactor accident. The 2011 Tohoku earthquake (M9.0) occurred off the Japanese Pacific coast at 2:46 p.m. on 11 March 2011. What began as a peaceful sunny Friday, ended with an unexpected earthquake that triggered huge tsunami waves claiming many precious lives. Tsunami warnings were issued for the Japanese coast and many areas of the Pacific Rim. The JMA tide gauge station at Soma in the Fukushima Prefecture observed a 9.3-meter-high tsunami wave. The tsunami run-up height rose to over 40 m at Miyako City in the Iwate Prefecture. Tsunami waves arrived as far away as the west coasts of the United States and Chile.




*Horizontal displacements five hours after the main shock as determined by GEONET.*

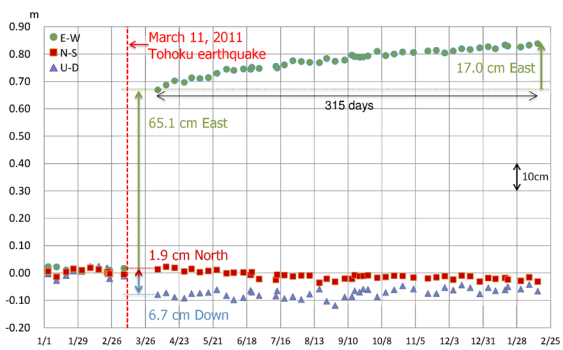
After the main shock, many huge aftershocks occurred. An M7.6 aftershock happened off the coast of Ibaraki at 3:15 pm; two other massive aftershocks of M>7.0 followed within less than an hour after the main event. In the one-year period up to 11 March 2012, some 602 aftershocks of M>5.0 were registered; 97 of these were larger than M6.0 and six exceeded M7.0.

*Twisted railway tracks near Kashima (Photo by T. Kondo).*

In Tsukuba City, where the Geospatial Information Authority of Japan (GSI) is located, the main shock caused a blackout for two days and an interruption in the water supply for three days. Roof tiles of many residential buildings came down; boundary fences and walls collapsed. Most of the Tsukuba VLBI station equipment, however, survived with only minor damage. Since we were concerned about further aftershocks, we suspended VLBI operations. Meanwhile, at Kashima, the damage was much worse: tsunami waves swamped the area and railway tracks near NICT were twisted (see photo).

The Japanese GPS Earth Observation Network (GEONET), a 1200 GPS station network established and maintained by GSI, observed the largest displacements that it had seen in its almost 20-year lifetime. At the GPS station "Oshika" close to the epicenter, displacements of 5.3 m in the horizontal and −1.2 m in the vertical were registered. These values comprise the co-seismic displacements of the main shock and several aftershocks plus the post-seismic movement in the first five hours after the megaquake. Most parts of eastern Japan moved to the southeast or east and subsided. Since the earthquake, 0.79 m of post-seismic movement was detected at the northeastern coast station "Yamada."

VLBI operations at Tsukuba started again on 4 April 2011 with session R1477. The seismic displacement (co-seismic plus post-seismic) detected by this session was (E,N,U) = (65.1, 1.9, −6.7) (cm). The additional post-seismic movement over the 315 days since this session was (17.0, −4.5, 1.3) (cm). Tsukuba is one end of the single baseline of the dUT1=UT1−UTC weekend Intensive session series (Int2). In the analysis of one-baseline sessions, the positions of the two baseline sites must be fixed to a priori positions in order to estimate dUT1. If the Tsukuba position is not corrected, post-earthquake position variation will propagate into dUT1 estimates. We are now correcting the TSUKUB32 position in the operational analysis using the most recent post-earthquake position change determined from the JPL time series for the co-located GPS receiver TSKB. Our correction is available at ftp://gemini.gsfc.nasa.gov/pub/misc/dsm/tsukuba/. Applying this correction, dUT1 agrees with the IERS Bulletin A combination series (finals.daily) produced by the U. S. Naval Observatory at a level of 15 μsec WRMS. This is the same level of agreement as for the weekday Intensives (Int1) on the Kokee–Wettzell baseline.




*Position (E,N,U) of the Tsukuba 32-m VLBI antenna after the earthquake.*

## Observing CONT11

*– Rich Strand, NVI Inc.*

The analysis team has released the operational results for each station assigned to participate in CONT11. This session started 15 September 2011 and ended 15 days later with almost 11,000 observations done each day by the thirteen stations. These VLBI measurements are the most precise to date and will be used to form comparisons with the other techniques in the field. We can assume continuous observing will be one of the features for VLBI2010, so CONT11 is a good session for us to review.

On average, the stations lost overall about 5% of the data—that is, if you disregard some sessions that were impacted by really bad luck due to weather or major equipment failures. It is the nature of our business that everything has to work and losing two or three stations in a 24-hour session can cause over 20% of data loss. CONT11 gives us good guidelines of how to observe this kind of continuous sessions and where the stations can possibly improve by operator intervention or where the technology needs to be improved to produce quality data. As is often the case, it can be a mix of both.

Lost channels and spurious signals caused an impact to CONT11. RFI is a big problem in S-band for many stations as it is a shared spectrum. There is hope that VLBI2010 can solve some of the RFI issues with a different frequency selection scheme. Understanding the source, frequency and amplitude of RFI can be helpful as we may be able to notch or reduce it in the IF2 path by filters.

CONT11 pre-checks sent to each station included procedures written by Brian Corey and Ed Himwich that allowed the stations to measure spurious emissions found in the data acquisition rack. Some of this RFI is found in the new equipment deployed into the field and still under investigation. The TOW handbooks have Brian's review of RFI impact and detection. The FFT signal analyzer is a valuable tool that can be used for detecting spurious signals causing RFI, and the staff at all observatories should have access to one.

The Mark 5 recording system produced its share of the problems. Most of these may have been preventable by the operators following published guidelines in the session notes. Some data loss caused by the Mark 5 is still under investigation by Dan Smythe and Ed. Operators in the field should try for a clear and orderly understanding of disc pack recording errors reported by the FS and what steps are necessary to allow the Mark 5 to be functional again.

CONT11 observing allowed very little time for station maintenance and telescope checks. This caused some stations to start the session late after a repair but this is an assumed risk designed into the observing strategy. Having everything necessary for the repair available and the station staff ready for the system checks as soon as a session ends helps provide fast recovery and the best chance the session will start on time.

Data loss caused by things out of our control are antenna and equipment failures, transfer of data problems, power outages, windstorms including a typhoon and events not corrected quickly due to unattended observing. Nevertheless, even with everything that can go wrong at any radio observatory we still had sessions with collection yields as high as 97%.

Upcoming Meetings...

EGU General Assembly 2012
Vienna, Austria
April 22-27, 2012

AOGS-AGU (WPGM)
Joint Assembly,
Singapore
August 13-17, 2012

XXVIII IAU General Assembly
Beijing, China
August 20-31, 2012

11th EVN Symposium
Bordeaux, France
October 9-12, 2012

AGU Fall Meeting,
San Francisco, CA
December 3-7, 2012

http://ivscc.gsfc.nasa.gov/meetings

In future issues of this "How To" column Mike Poirier and I will examine and review some of the station checkout procedures used to verify station compliance for CONT11. Along with discussions with experts and the folks that design our equipment we hope to provide useful information for the IVS stations around the world.

*The following stations participated in CONT11 and I used their station notes, logs, and analysis comments to prepare this paper for the newsletter: Badary, Fortaleza, HartRAO, Hobart, Kokee, Ny Ålesund, Onsala, TIGO, Tsukuba, Westford, Wettzell, Yebes, and Zelenchukskaya.*

The IVS Newsletter is published three times annually, in April, Decust, and December. Contributed articles, pictures, cartoons, and feedback are welcome at any time.

Please send contributions to
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The newsletter is published in color with live links on the IVS web site at

http://ivscc.gsfc.nasa.gov/.

## Some Highlights of the 13th IVS Analysis Workshop

*– Axel Nothnagel, IGG Bonn*

The 13th IVS Analysis Workshop took place at the Royal Observatory of Madrid, Spain, on 8 March 2012 with about 40 participants. The most important discussion item of the meeting was the handling of atmospheric gradients. After a presentation by Dan MacMillan and a lively discussion by the attendants it was decided that the Chen and Herring (1997) model with the coefficient c = 0.0031, as published in this paper, should be the conventional model of the routine IVS analysis activities. There are no significant differences between the MacMillan (1995) and the Chen and Herring (1997) models. However, for consistency with the IGS analyses, the C&H model is favored. All IVS Analysis Centers are asked to use the Chen and Herring formulas for estimating atmospheric gradients from now onwards.

Another important analysis issue was the application of non-tidal atmospheric pressure loading corrections, which has been under discussion already for quite some time. The Global Geophysical Fluid Center of the International Earth Rotation and Reference Systems Service (IERS) has now issued a call for submitting solutions with and without pressure loading corrections for a detailed comparison campaign over all space-geodetic techniques. The GSFC, TU Vienna, NMA, and Observatoire de Paris VLBI analysis groups volunteered to respond to the call to provide comparison solutions in SINEX format with specified solution setups. We hope that the IVS conviction will prevail that corrections of atmospheric pressure loading at the observation level are necessary and should be applied.

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