

# IVS Newsletter

Issue 13, December 2005



## Chile Eagerly Awaits IVS General Meeting in January 2006

- Hayo Hase, BKG and Dirk Behrend, NVI, Inc./GSFC



The official poster of the 4th IVS General Meeting in Chile was designed by artists of the Universidad de Concepción. A limited number of printed copies is still available and can be requested from the Coordinating Center or the local organizers.

The 4th IVS General Meeting will be held in Concepción, Chile on January 9-12, 2006. It will be the first time in service history that an IVS event be celebrated on South American territory. With very few VLBI stations in the southern hemisphere, this constitutes an excellent opportunity to foster awareness of the VLBI technique for geodesy and astrometry in South America and in Chile in particular.

VLBI is at the beginning of an innovation period that will ultimately culminate in a next generation VLBI system. The motto of the meeting is thus “Next Generation VLBI2010”. A new geodetic VLBI instrument that will meet requirements for the coming decades is envisioned to

have small, fast moving antennas, high-speed networks, new correlator systems, and a streamlined data analysis pipeline. Now is the time to initiate system studies and simulations as well as development projects and prototyping to help bring this vision into reality. Keynote speakers will be asked to address the keynote in their presentations.

The content of the meeting will be of interest to the broad spectrum of IVS members as well as to the wider VLBI and Earth science community. All IVS Associate Members and individuals who have interests in the various applications and research fields of VLBI such as geodesy, astrometry, Earth sciences, and related fields are encouraged to attend the meeting.

The program of the meeting is currently being put together and will be posted on the meeting web site once it is finalized. The expected posting date is early December 2005. Registration is open till December 9. Travel and local information can be accessed on the web.

<http://ivscc.gsfc.nasa.gov/meetings/gm2006>

### Did you know that..

- Chilean Summer time is UT-3h.
- Electrical Power is 220VAC, 50Hz.
- Chile has been a democracy since 1990.
- Economic growth is since then about 5-7% per year.
- Chile is the world's biggest copper producer.
- Chile's Atacama Desert is the world's driest area.
- Chile's Campo Hielo del Sur is the world's third largest glacier area.
- Chile's Easter Island is the world's most distant island to any other land surface.
- The Chilean 1960 earthquake (magnitude 9.5) was the strongest event of the last century; one quarter of the seismic energy of the whole century was released.
- Chile is 4,000 km long; Concepción is situated in the center between both extremes.
- Chile's official currency is the Chilean Peso (1 USD = 520 CLP).

## VLBI East Coast Meeting Held at Goddard

- Dirk Behrend, NVI, Inc./GSFC

On October 17-19, 2005 the Goddard Space Flight Center VLBI Group hosted a two-and-a-half-day VLBI event reviving a tradition of VLBI meetings held among U.S. East Coast institutions. The last meeting of this type was held about a decade ago. It is anticipated that this is the first of a new series of meetings to be conducted on a roughly annual basis. The intent of the meetings is to address the current status and future development of VLBI and to coordinate the efforts of the institutions based in eastern North America.

The Goddard meeting was attended by 23 participants coming from GSFC, USNO, Haystack Observatory, NRAO, and NRCAN. The topics covered were mainly focused on the analysis side ranging from the current accuracy, the improvement of the observables, to station and external effects. The presentations and notes of the meeting will be made available on the Goddard VLBI Group web site once the redesign of the site is finalized.

# Good Luck Nancy

## Nancy Vandenberg Retires as IVS Coordinating Center Director



*About a year ago, Nancy Vandenberg began to pass on her duties as IVS Coordinating Center Director to Dirk Behrend as her successor. The transition period, during which both have worked well together, was officially completed as of the last IVS Directing Board Meeting in September 2005. This feature is dedicated with deep thankfulness to our first IVS Coordinating Center Director, who helped to set up the path on which IVS is now working.*



*(Top) In 1957 Nancy (with help from her Dad) made a replica of one of America's first satellites. Here she is showing the model in her 6th grade class.*

*(below) In 1974, Nancy gave a seminar on her thesis topic in the University of Maryland physics lecture hall. Tom Clark is moderating the question period in this photo.*

*How and when did you come to VLBI?*

After my first year of graduate school at the University of Maryland, I needed a summer job. I was taking Tom Clark's course on "Observational Radio Astronomy" and

when he announced that he had a student summer position available at Goddard Space Flight Center, I asked for the job. My introduction to VLBI started when Tom began a collaboration with Irwin Shapiro and his students at MIT and Alan Rogers at Haystack. I did my thesis, with Tom as my advisor, on low frequency VLBI observations of pulsars. I also participated in the famous Quasar Patrol observations in the early 1970s using Haystack and Owens Valley.

*What was the challenge for you, when you entered the field of VLBI?*

The Mark I VLBI system used standard 9-track computer tapes, thousands of them, each recording 3 minutes of data. The biggest challenge for me was lifting all those 50-pound boxes of computer tapes that we had to pack, transport, record, and catalog.

In those days, VLBI observing was done by sending people (usually graduate students) to the telescopes to operate the equipment, mostly the tape recorders. That part

I wouldn't call a challenge, rather it was fun going on observing trips to Green Bank, Owens Valley, and Goldstone. One day after setting up equipment at Goldstone, Tom Clark drove us back to Barstow in the rental car via a dirt road passing through the old abandoned ghost town of Goldstone. I spotted something by the side of the road that turned out to be part of the town sign – so as a souvenir I still have a broken old wooden road sign, with two bullet holes in it, that says "...STONE" to remind me of that trip.

*It is hard to imagine that VLBI worked for so long without an existing IVS. How was that possible?*

Well, when the idea of a formal organization for geodetic VLBI came up in the 1990s, there were many people who thought we didn't need it. By its very nature VLBI has to be a cooperative technique, and so all the participating agencies and telescopes have always worked together. We already had a successful international network of geodetic VLBI stations, why change it? Eventually the usefulness of an organization for geodetic and astrometric VLBI was recognized, as well as the necessity for some organization to be the "service" that would provide regular VLBI products for Earth science. And, I think it's no surprise that we were very successful in making IVS work well in such a short time period, because the VLBI groups already had so much practice working together.

*Your career started like a young scientist with good technical skills and ended with the management of a global infrastructure for Earth observation with VLBI methods. Looking back - are you satisfied with your achievements?*

My achievements such as they are must be shared with all the people with whom I have worked through the years of my career. The technical challenges have been fun, especially working with people to figure out the details about how things should work best and then making it happen through writing programs, writing documents, and doing testing. Many of the management challenges came with the startup of IVS, when Tom Clark and James Campbell did so much to help get things started.

I think that a lot of the growth of IVS can be attributed to the strong leadership Wolfgang Schlüter has shown. It may seem surprising that the Directing Board elected as its first Chair someone whose background was in laser ranging, but the choice has proved very beneficial to VLBI. Wolfgang's insistence on timely and high quality products and his idea that we needed to formulate ideas for the future have given IVS focus and goals. I enjoyed working closely with him to help set up a well-run organization with a powerful future vision.

I also appreciate very much the dedication of all the Directing Board members who have contributed their time and efforts toward the growth and good reputation of IVS.



*In hindsight, what was the most satisfying moment in your IVS career? Is there anything you are very fond of remembering?*

It may seem like a small thing, but I am proud that IVS has been able to publish its Annual Reports usually within a few months after the end of the reporting year, an achievement that few organizations can match.

It has been a pleasure and privilege to work with VLBI station operators, programmers, analysts, and scientists throughout my career. I learned that it's not important for me to be an expert on anything, because there are truly specialists throughout the VLBI community and I only have to call on them for advice and information.

*Is there anything you could not achieve, but feel important to happen in the future?*

I am leaving IVS just as the results of Working Group 3 on the next generation VLBI system are being published. I hope that IVS will be able to see the ideas of WG3 realized in the future. I will miss not being able to participate in this interesting and important project. I also hope that the current thrust toward integration of the geodetic services will continue to move ahead. All of the services can only benefit from projects such as data combination, harmonization of station information, and finally making combined results readily available for scientists.

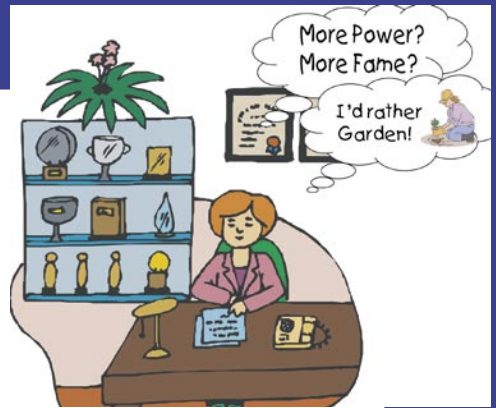
*What are your personal plans now – without the '7days/24h' availability for VLBI matters?*

First of all, I am very happy that I was able to gradually be relieved of my IVS responsibilities knowing that the work continues in Dirk's capable hands. I am always available to Dirk for any questions, and I also continue to offer him (sometimes unsolicited) advice. I am working a few hours each week with the Goddard VLBI group, which I will con-

tinue to do as long as I can be useful.

When my husband retired in summer 2004, we moved to an old (c. 1895) restored farmhouse in Virginia on the Chesapeake Bay. We have put in a big garden and orchard, something we've always wanted to have time and space to do. We are growing vegetables, flowers, herbs, fruits and berries, and we're using our produce to cook great meals as well as doing a lot of canning and preserving. As of last month, we have a new 31-foot cruising sailboat at our dock, and we are spending as much time sailing as possible before the really cold weather arrives. We are able to spend a lot of time reading, and are also planning some road trips across the US. We have a quiet life at a much slower pace now, and we are enjoying ourselves enormously.

I miss being in e-mail touch constantly with people around the IVS world, and I do miss the daily interaction with colleagues and friends at Goddard, but I love this peaceful life very much.



*A cartoon like this one inspired Nancy in 2002 and motivated her toward retirement.*



*Nancy shows off part of their garden's chile pepper harvest.*

## IVS Chair Wolfgang Schlüter about the time he shared with Nancy...

*Nancy was instrumental in setting up the IVS about 7 years ago and laid the foundation of what IVS is today. As IVS Chair, you worked very closely together with Nancy for quite a long time. What can you tell us about your working experience?*

In February 1999 at the first board meeting, I was asked to take over the position as IVS Chair. I thought to myself that the VLBI community was already quite well organized and coordinated, mainly thanks to Nancy, and that even I was able to take on the responsibility of IVS Chair in close collaboration with Nancy. She was known for her outstanding character. Nancy was well versed and experienced from the very start and was leading the efforts to establish the IVS. I appreciate her background and I benefited from her strong commitment to IVS manifesting itself in an always reliable support.

*How do you feel about her retiring?*

After 7 years of very close collaboration, of course, I cannot help some sentimental feelings. Nevertheless, I'm very grateful that I had the fortune to work with her for all those years that were so important for IVS. The IVS was formed with significant contributions from her side, as can be seen in the fact that IVS was established as a service, in the creation of an own service profile, and in developing future prospects, among other things. With the employment of Dirk Behrend, having an overlapping period during which Nancy introduced him to take over smoothly her functions, I have confidence for a smooth transition and that we can continue in the spirit set up by Nancy.

## What's Next in Making VLBI2010 Happen?

— Bill Petrachenko, Natural Resources Canada



Author Bill Petrachenko is the chairman of the new VLBI2010 Committee.

After seven years of existence, the IVS is still evolving and adapting to become more effective. At the last Directing Board meeting, a charter was accepted for the formation of the VLBI2010 Committee (V2C). As the name implies, an important function of the V2C will be to carry out the recommendations of the recently released final report of IVS Working Group 3 (WG3) entitled “VLBI2010: Current and Future Requirements for Geodetic VLBI Systems”—much in the same way that the Observing Program Committee (OPC) was struck to carry out the recommendations of IVS WG2.

Much was learned in the WG3 process. However, it also became clear that more information was needed before detailed specifications for a new system could be proposed. An important conclusion of the WG3 final report was that 13 areas of study/development needed to be conducted to provide this information.

IVS working groups are by definition specified to have a finite lifetime. However, it should be clear that, for VLBI to contribute to global geodesy at the highest possible level, it is necessary that the research activity directed at continuously improving the technique be on-going. In this context, the concept of an IVS systems group began to emerge. It was proposed that the group have both the responsibility of promoting and guiding research into the improvement of geodetic VLBI in general, and more specifically the responsibility of encouraging the implementation of the recommendations of WG3. The systems group was brought into existence at the last IVS Directing Board meeting and named the VLBI2010 Committee.

An attempt was made to select committee members from a wide range of expertise and geographic locations. The initial members are Bill Petrachenko (chair), Dirk Behrend (ex officio), Johannes Böhm, Brian Corey, Rüdiger Haas, Yasuhiro Koyama, Dan MacMillan, Zinovy Malkin, Arthur Niell, and Gino Tuccari. New members can be added or experts asked to participate temporarily as the need arises.

The committee meets once a month by telecon and minutes will be posted on the IVS web site. In addition, a moderated memo series will be maintained for discussion of topics pertaining to the improvement of the technique. The series will be open to anyone with well-written relevant material to contribute.

Over time, it is expected that the V2C will develop and maintain outputs such as:

- a list of all known error sources;
- a list of strategies for reducing all known error sources;
- a prioritized list of actions required to improve the technique;
- a list of all standard interfaces needed to achieve system-wide compatibility;
- standardized specification for each system component;
- publicly available software, e.g. to carry out simulations.

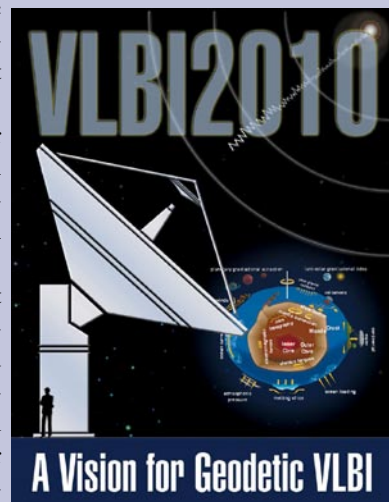
The V2C cannot function in isolation. There is simply too much to be done. I would encourage all IVS members to maintain an awareness of the activities and goals of the committee to see how they might contribute. Remember that the V2C memo series is open to contributions from anyone and, of course, all V2C members would be happy to receive useful suggestions or comments.

In my opinion, the V2C will serve a crucial function in the IVS and needs to be supported within the community at the maximum possible level. The understanding and priorities developed will provide a rational basis for all new developments. To use an old adage, without a strong V2C, technique improvement in the IVS will proceed much like a ship without a rudder.

<http://ivscc.gsfc.nasa.gov/about/com/v2c>

### IVS WG3 Final Report Available

IVS Working Group 3 examined current and future requirements for geodetic VLBI systems, including all components from antenna to analysis, and prepared a final report with recommendations for a new generation of systems. The report is available as pdf file at the IVS web site. This newsletter was sent out with a printed, black-and-white version of the report. Please contact the Coordinating Center if you would like to request additional copies or a color copy of the report.



[http://ivscc.gsfc.nasa.gov/about/wg/wg3/IVS\\_WG3\\_report\\_050916.pdf](http://ivscc.gsfc.nasa.gov/about/wg/wg3/IVS_WG3_report_050916.pdf)

## CONT05 Successfully Observed

– Dirk Behrend and Cynthia Thomas, NVI, Inc./GSFC

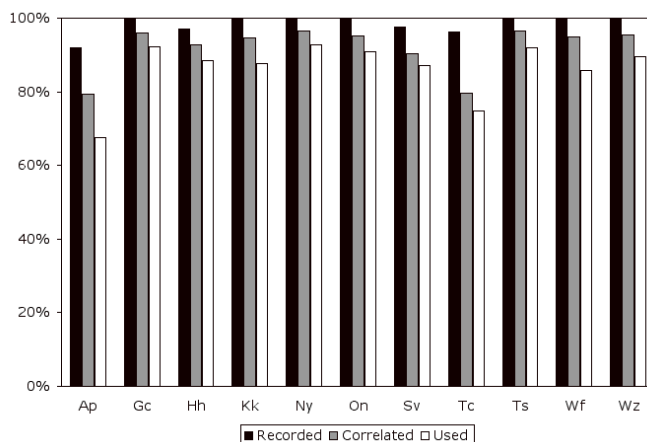
The period September 12-27 saw 15 days of continuous VLBI observations at eleven IVS stations. The CONT05 campaign was extremely successful with only very few problems encountered at the stations. Eight of these 11 stations already had previous CONT experience. The “newcomers” (Svetloe, Tsukuba, and TIGO) almost unanimously stated that CONT05 ran very smoothly. Jenny Neumann from TIGO was astonished by the high shipment cost of the disk media in September. Clearly, eVLBI (or e-transfer) could help in reducing the overall cost by eradicating the shipment cost. E-transfer was already a reality for Tsukuba which recorded the CONT05 campaign on K5 disks and e-transferred the data to Haystack. Junichi Fujisaku confirmed that the 15 days of continuous K5 observing went very smoothly and no major problems were encountered. He added: “K5 observing went well in an unmanned, automatic mode during most of CONT05.”

At Haystack, Jason SooHoo took over the Tsukuba data and converted them to Mark 5. “Each transfer took roughly 3 days per 24-hour session, that includes transfer, conversion, and disk writing,” says SooHoo. “To transfer 15 days of data with more than 10 TB of data, marks a new achievement in the use of eVLBI.” He further elaborates, “The eVLBI transfers were managed at Haystack by the first production version of the so-called EGAE (‘Experiment Guided Adaptive Endpoint’) software which has been under development for the past couple of years at Haystack. The process starts when Tsukuba, which records data on the K5 system, transfers a day’s worth of data on a local fileserv-er. The EGAE software then manages the transfers of the data across high-speed networks to Haystack Observatory, conversion to Mark 5A format and writing to Mark 5A disk packs. The disk packs are then shipped, as necessary, to the target correlators.”

The correlation effort was split among the correlators in Washington (8 sessions), Bonn (5 sessions), and Haystack (2 sessions) according to the correlator availability and estimated processing factors (ratio correlation time to observation time). But the correlators’ work had already begun a couple of months before the actual CONT05 observing: all stations had to be supplied with disk media. Though in general this worked quite well, there were a few glitches. Alessandra Bertarini, Bonn Correlator, reported that a module sent to Algonquin Park, Canada went mysteriously missing. “After a lot of e-mail traffic between Algonquin, Bonn and the courier, it was finally discovered that the module was mistakenly sent to Effelsberg, Germany for an astronomy campaign,” she said.

The sharing of several sessions on one disk at one station and spreading them over several disks at another was easily handled at the correlators. No major problems were encountered in the sessions correlated so far (with the no-

table exception of C0507 which had to be recorrelated due to a station unit problem). In order to have a homogeneous data set over all 15 days, a correlation standard was agreed upon. Since the correlation was already in progress when the decision was made, some sessions needed to be recorrelated or refringed. From the 15 session days nine have been correlated and partly analyzed at the time of writing.



CONT05 campaign recorded, correlated, and used data in percentages of the scheduled data (based on 9 out of 15 days).

The CONT05 campaign appears to yield very good results. David Gordon from Raytheon/GSFC reported that “the formal errors for the EOP solution are considerably better than the R1s and R4s reaching about the same level as the RDVs.”

Formal errors of the EOP parameters for C0501, R4189, and RDV40.

Parameter	Formal Error		
	C0501	R4189	RDV40
Xp	34 $\mu$ arcsec	77 $\mu$ arcsec	31 $\mu$ arcsec
Yp	36 $\mu$ arcsec	69 $\mu$ arcsec	32 $\mu$ arcsec
UT1	1.4 $\mu$ sec	2.8 $\mu$ sec	1.4 $\mu$ sec
Psi	72 $\mu$ arcsec	174 $\mu$ arcsec	59 $\mu$ arcsec
Eps	26 $\mu$ arcsec	63 $\mu$ arcsec	26 $\mu$ arcsec

This excellent result could only be achieved through a concerted effort and exceptional work done at the stations and the correlators. We would like to thank all for their strong commitment and continued enthusiasm.

<http://ivscc.gsfc.nasa.gov/program/cont05/>



## Highlights of the 14th IVS Directing Board Meeting

—Wolfgang Schlüter, IVS Chair, BKG

The 14th Directing Board Meeting was held in Washington, DC at the U.S. Naval Observatory on Monday, September 12, 2005. A detailed report of the activities of the board



*IVS Chair Wolfgang Schlüter presents Nancy Vandenberg, the outgoing Coordinating Center Director, with a plaque certifying the appreciation for her accomplishments as Director of the Coordinating Center and her role on the Directing Board.*

meeting can be found on the IVS web under the board meeting notes at <http://ivscc.gsfc.nasa.gov/about/org/board>. Here we summarize the most important items.

### *Official Change of Coordinating Center Directorship*

At the meeting the board members were informed that Dr. Nancy Vandenberg retired from her position as Coordinating Center Director and that Dirk Behrend would take over the responsibility of this position. The change was approved by the board and marks the end of a transition phase during

which Nancy introduced Dirk into the tasks of the Coordinating Center and the Observing Program Committee. I wish Dirk a successful continuation of Nancy's work and would like to congratulate him on filling this highly responsible position within our community. The venue at USNO was deliberately chosen in order to have both on the meeting. In the evening all board members gathered for a common dinner at Kerry Kingham's house following his and his wife's kind invitation. This was the ideal setting to express our personal appreciation for Nancy and to say farewell.

### *Change of the Terms of Reference (ToR)*

At the last director's meeting of the Federation of Astronomical and Geophysical Data Analysis Services (FAGS) in Paris—IVS Newsletter reported in Issue 13—Dirk and myself learned that IVS, being a member service of FAGS, has a FAGS representative on the IVS Directing Board and that Roy Booth was the appointed representative. As the IVS Terms of Reference

(ToR) did not reflect the ex officio board representation of FAGS, they had to be changed accordingly. The new non-

voting FAGS member increases the size of the board to 16 people altogether. The FAGS representative is appointed by FAGS and serves ex officio on the board. Roy Booth could not attend the meeting in Washington, but he is very much welcome on the board. We look forward to a continued and fruitful collaboration with FAGS.

### *VLBI2010 Report Released*

The IVS Working Group 3 (WG3), co-chaired by Arthur Niell and Alan Whitney, presented its final report entitled "VLBI2010: *Current and Future Requirements for Geodetic VLBI Systems*". The report was accepted with great éclat and the WG was closed. The report will be instrumental in planning the future of geodetic VLBI. It is foreseen to widely distribute the report (beyond the VLBI community) in order to enhance the visibility and future need for VLBI, in particular in view of IAG's long-term project "Global Geodetic Observing System" (GGOS). The GGOS project was recently established at the IAG General Assembly in Cairns, Australia and will influence the geodetic research activities in the coming decades. A tremendous amount of work has been carried out to prepare and finalize the report. We really can be proud that IVS prepared this document which could be regarded as an important guideline for our future planning.

The report was reviewed by Jan Kouba and Gerhard Beutler. Both expressed their appreciation independently documenting that IVS did steps in the right direction. I would like to thank the two chairs Arthur Niell and Alan Whitney, but also the main contributors Nancy Vandenberg and Bill Petrachenko as well as the sub-groups chairs, including the members who contributed significantly to the report, for creating this important and successful document. I also thank Gerhard and Jan for their review.

The report gives suggestions and recommendations for future actions. In order to accommodate this, the Directing Board established the VLBI2010 Committee. Please see page 4 in this Newsletter issue for more information.



*Nancy happily leafs through the IVS components' booklet of appreciation. Nancy's arm is in a sling while she is recovering from shoulder surgery.*

*Dear IVS Associate Members,*

*Thank you very much to everyone who contributed pages of appreciation presented to me following the September IVS Directing Board meeting. Wolfgang had bound the pages into a book and organized them according to types of IVS Components. I think of the book as my personal "annual report" from all the IVS Components. It's a wonderful way to remember all the people with whom I have worked. I have read the pages and looked at the pictures many times over, and I will always treasure your kind thoughts.*

*It has been a privilege to work with so many fine people in the VLBI community, and I appreciate the support that you gave to me and to IVS.*

*My best wishes to everyone for continued success in all the tasks and challenges that IVS will face in the future,*

*Nancy Vandenberg*

# VLBI How To...

## Baseline Lengths Online

—Axel Nothnagel and Markus Vennebusch,  
Geodetic Institute of the University of Bonn

The lengths of the baselines between the VLBI stations observing in an individual network session are the results which are the easiest to understand and to interpret. It has long been recognized that the scatter of the baseline length results is a reliable indicator of the quality of the observatory as well as of the analysis. At the observing sites, graphical representations of the baseline length results are, thus, often used to display the achievements and to show the public what the observations are used for.

Within the framework of the IVS Pilot Project “Time Series of Baseline Lengths” five IVS Analysis Centers—Federal Agency of Cartography and Geodesy, Leipzig, Germany (BKG); NASA Goddard Space Flight Center, Greenbelt, MD, USA (GSFC); Institute for Applied Astronomy, St. Petersburg, Russia (IAA); Institute for Geodesy and Geophysics, Vienna, Austria (IGG); and U.S. Naval Observatory, Washington D.C., USA (USNO)—regularly provide their results to the IVS Data Centers in the form of a special file format (SINEX). From these files the IVS Analysis Coordinator’s office computes baseline lengths and their standard deviations. In addition to the results of the individual analysis centers, a combined series is computed. Updates are created roughly every four weeks. The accumulated results and their statistics are now available at the Analysis Coordinator’s web page at <http://vlbi.geod.uni-bonn.de/IVS-AC>.

An interactive page asks for a selection of the baseline of interest in the form of drop-down bars containing all VLBI sites ever used in geodetic sessions. Currently, a straight line fit with corresponding statistics is computed online. The computation takes into account any discontinuities in the time series, i.e., changes in station positions caused by man-made or geophysical displacements. The information about the epochs of the displacements is stored in a special file. The baseline length results and the linear regression line are made available in a graphical representation.

We would be very pleased if this page and its information be widely used. The pilot project is ongoing and any feedback and suggestions for amendments are very much welcome.

### Upcoming Meetings...

AGU Fall Meeting San Francisco, USA December 5-9, 2005	IVS Directing Board Meeting Concepción, Chile January 13, 2006
Fourth IVS General Meeting Concepción, Chile January 9-11, 2006	EGU General Assembly 2006 April 2-7, 2006 Vienna, Austria
7th IVS Analysis Workshop Concepción, Chile January 12, 2006	<a href="http://ivscc.gsfc.nasa.gov/meetings">http://ivscc.gsfc.nasa.gov/meetings</a>

## Help, My Receiver is Warm!

—Mike Poirier, MIT Haystack Observatory

I am sure most of you have discovered equipment that had failed prior to the start of a session. If possible we just repair or replace it with a spare. However, one of the items that is not so easily repaired or replaced is the cryogenic system hardware. Many times I have arrived on site and discovered that the receiver had warmed. After the immediate panic subsides, you must find out why it failed and decide whether it can be repaired in a timely manner.

First, I would check to see that the compressor is running. Sometimes at Westford we have had power spikes that tripped the compressor off. If the compressor is running, check to see that it has the correct helium pressure. You can also check to see that the helium pressure gauge pulsate with the pumping cycle of the crosshead. This will confirm that the piston is moving within the cylinder. If all this appears normal, go up to the crosshead and listen to it pumping. There may be a “banging” noise that could indicate there is contamination in the cylinder that has frozen out. If it is banging, the system will have to be warmed fully so that the contamination can be removed by purging. How to purge the system will be described in a future IVS newsletter.

In any case, a decision must be made whether to run the session with a warm receiver or to attempt a cool down. If cooling the receiver would take longer than 8 hours to complete, run with the receiver warm. This includes the case where you would have to wait long enough for the receiver to warm up to room temperature so that the total time until being cold would be longer than 8 hours. Note that for some receivers, once the pump is removed, typically after about 6 hours of cooling, the antenna can be used for observing while the cool-down continues. If at the start of the experiment, the dewar is at room temperature, and if the reason for failure is known and has been repaired (e.g., broken line or compressor tripped off), and you expect to get the receiver cold within 8 hours, go ahead and cool the receiver. If the cool down process fails, or the receiver starts to warm after you start the session, continue to run the session with a warm receiver.

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

Please send contributions to [ivs-news@ivscc.gsfc.nasa.gov](mailto:ivs-news@ivscc.gsfc.nasa.gov). The editors reserve the right to edit contributions. The deadline for contributions is one month before the publication date.

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The newsletter is published in color with live links on the IVS web site at <http://ivscc.gsfc.nasa.gov/>.



Time is the longest distance between two places.

— Tennessee Williams

## eVLBI Goes Down Under

—Tasso Tzioumis, ATNF, CSIRO



Participants at the fourth eVLBI Workshop in Sydney.

The 4th eVLBI Workshop was held in Sydney, Australia July 12-14 and followed the success of the previous eVLBI workshops held at Haystack (2002), JIVE (2003), and Tokyo (2004). It was organized and hosted by the Australia Telescope National Facility (ATNF) at its headquarters in

Marsfield, Sydney. The workshop was generously sponsored and supported by the Australian Academic and Research Network (AARNet) and the LBA partners ATNF, the University of Tasmania and Swinburne University of Technology. It was attended by about 60 participants from 9 countries.

The workshop presented a new opportunity to share the experience of progress and developments in eVLBI around the world and to explore possibilities for coordination and cooperation. The standard of presentations was again very high and many new results and plans were presented. eVLBI is set for rapid progress around the world in the next few years.

The recently funded European EXPRoS eVLBI project will result in a production eVLBI network at 1 Gbps within the next 3 years. All presentations from the workshop are available online at <http://www.atnf.csiro.au/vlbi/evlbi2005/>

CSIRO announced that funds will be made available to build the “last mile” fibre tails to the ATNF antennas (ATCA, Mopra, Parkes) and connect these antennas via the AARNet3 regional network. The CSIRO contribution is about A\$2M and represents a very significant step towards eVLBI in Australia.

The workshop was followed by a quick “observatories tour” of the ATNF telescopes at Narrabri (ATCA, 6 x 22m), Mopra (22m), Parkes (64m) and the NASA DSN station at Tidbinbilla (70m, 34m). These are spread over great distances in New South Wales, Australia and the tour covered 1800km over 3 days! The tour also included a visit at a local vineyard and winery and it was greatly enjoyed by all participants, despite the long driving distances.

This workshop completes the first cycle of annual eVLBI workshops around the world. A new cycle will commence with the next eVLBI workshop in 2006 to be hosted by the Haystack Observatory.

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