Contents

Calendar of IRAM Meetings

- *May 27th, 1993*
  Multibeam Bolometer Software Meeting
  Location: IRAM Grenoble Contact : B.Lazareff
- *June 28/29th, 1993*
  IRAM Executive Council
  Location: Granada
- *December 6/7th, 1993 (tentative date)*
  IRAM User Meeting and Meeting of the SAC
  Location: Grenoble Contact : M.Grewing

30-m Telescope

Receivers

3 mm Schottky Receiver

The 3 mm Schottky (pointing) receiver — one channel — cannot be tuned because of a defective LO-coupler; hereby we have lost the possibility to observe at the (very) low frequencies (below 80 GHz). However, the repaired Millitech spare mixer has finally been returned (after 1.5 years) and we are planning a repair of this receiver (depending on proposals, perhaps not earlier than September, after H. Hein returns).

3 mm SIS

The 3 mm SIS was equipped, in August 1992, with a new Nb-junction mixer and has shown since then a reliable and improved performance ($T_{\rm R}$(SSB) below 100 K at 100–115 GHz). The new mixer required the installation of a 1.5 GHz IF; note that at 115 GHz LSB tuning the USB is at 118 GHz. There are occasionally remarks by the observers of increased instability (IF power) of this receiver; this needs further investigation. The recent performance of this receiver at the telescope is shown in Fig. 1.

2 mm SIS

After reliable and satisfactory operation, the Pb-junction of the 2 mm SIS receiver lost contact in December 1992. A Nb-junction, new for this receiver, was installed and the receiver shows good and reliable performance ($T_{\rm R}$(SSB) below 100 K at $\sim$ 145 GHz). The recent performance of this receiver at the telescope is shown in Fig. 2.

230 G2

The 230 GHz G2 receiver (Nb-junction, narrow band: 215 - 235 GHz) worked well during the whole period. A new HEMT amplifier was installed in August 1992. The recent performance of this receiver at the telescope is shown in Fig. 3.

230 G1

The 230 GHz G1 receiver (Pb-junction, broad band: 210 – 265 GHz) gradually degraded during 1992 (instabilities, higher noise temperatures, change in tuning settings). We therefore decided, in November 1992, to equip this receiver with a new Nb-SIS junction broad band mixer which has shown good performance in the laboratory (see the Newsletter 18 March, 1993). However, the restart of this receiver has caused many problems (misalignment of receiver optics, bad contact in IF output,

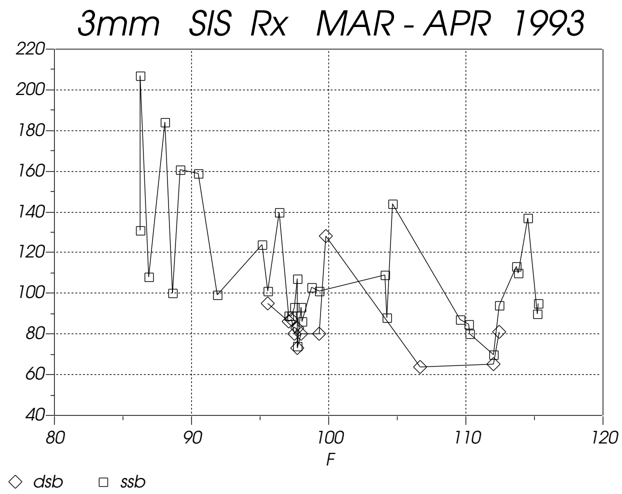

Figure 1: Performance of the 3mm SIS receiver

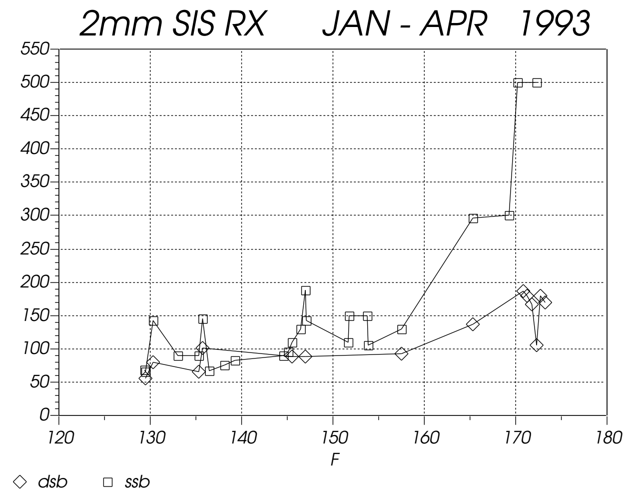

Figure 2: Performance of the 2mm SIS receiver

blocked backshort, broken vacuum tube) and only in April 1993 we seem to recover somewhat normal operation. The tuning parameters have been lost and only now we are collecting new data.

It appears that the highest frequency is 255 GHz (USB). Also, the difference in backshort position between SSB and DSB is (very) small, at least around 230 GHz, and rejections are not always secure; observers are advised to confirm the measured rejection by observation of a calibrated spectrum.

IRAM 230 GHz 1-channel bolometer

The IRAM 230 GHz one–channel bolometer and data acquisition system was tested at the telescope and provided to the astronomers in an observing run of November - December 1992 (15 - 20 days period). A coupling of the bolometer element and the horn (thermal contact) caused problems, however, the bolometer is repaired and functional with good sensitivity, approximately 70 - 100 mJy $\sqrt{s}$. The bolometer will be provided in a ± 2 week observing run in November–December 1993, concentrating on projects of point source observations.

Although frequently requested by the observers, remote tuning of the receivers is not yet possible; the installation of the first remote control unit is expected to occur at the end of the year.

Backends

The 2 correlators were made available in July 1992 for regular observations of 20, 40, 80, 160, 320, 640 MHz bandwidth, one receiver per correlator. At 320 and 640 MHz bandwidth, in particular, the correlators occasionally produce steps between the sub-bands; we thus advise to avoid the use of the correlators at these large bandwidths. The correlators can be used with the wobbler.

Although there exists a problem with the correlator chips, a program is available for localization of faulty chips, allowing immediate repair by the telescope operator — as long as spares are available. We recommend that the observers have a good check on the performance of the correlators — a chip may die suddenly and without warning.

The multitude of backends:

- one 100 KHz filterbank (with split mode)
- two 512 MHz filterbanks (one with split mode)
- one 500 MHz AOS
- two correlators (both with split mode)

required an updated receiver–backend connection and control. The backend group in Granada designed and constructed a new distribution box which is now being installed at the telescope. This unit will allow a computer controlled distribution (via OBS) of the IF outputs (now 4) to the backends (now 6), with the possibility to use also the correlators in split mode.

We hope that this unit is fully operational at the end of May.

Computer

A VaxStation 4000/VLC was installed at the telescope in order to improve off-line data reduction. Another VaxStation 4000/VLC is available at the Granada office. We are discussing the possibility/necessity to install another VaxStation at the telescope.

DAT tapes were installed and are available for the visitors at the telescope and the Granada office. We may start to replace several GRAPHON terminals by X–Window terminals.

Network software was installed to connect the different systems (VAX/Vms, PC-MSDOS, PC-Unix, VME/OS9, terminal server) and give access to the X25 data network; however, we have *recently* restricted the use of the X25 connection because of extremely high costs. A permanent

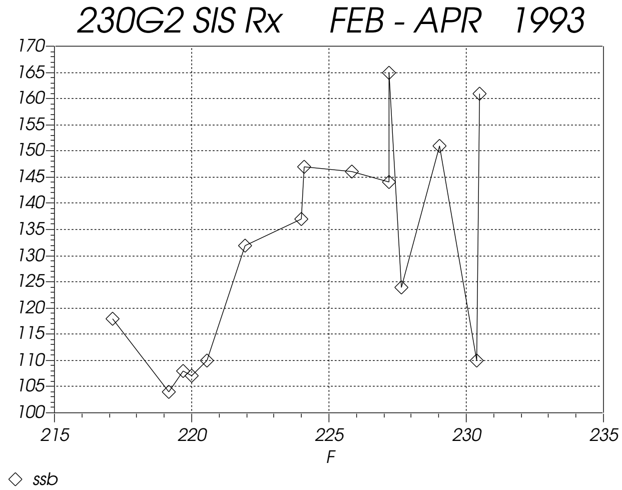

Figure 3: Performance of the 230 G2 SIS receiver

link to the University of Granada Computer Center was installed and this gives access to SPAN and Internet (see the on–line BULLETIN for further information).

Albert GREVE

Data Reduction

WARNING: because of an offset in the phase lock loop which was not compensated for in the software, old spectral correlator data are shifted by 97.656 kHz. Velocities must be corrected downwards (blue shifted) for Lower Side Band, upwards (redshifted) for Upper Side Band.

Improved computer facilities in Grenoble allow several data reductions to be carried out simultaneously. Investigators are requested to contact S.Guilloteau to schedule the data reduction in Grenoble. Because of unusual hardware problems mentioned above, *investigators should schedule a stay longer than 7 days in Grenoble for each project*, with ample time for discussion with IRAM astronomers.

Phase calibrators

We have started a project to investigate the use of weaker phase calibrators. Our list now include more than 200 sources, all of which are apparently usable as calibrators below 100 GHz. We also consider using systematically two phase calibrators for each project, in order to improve astrometric accuracy and to protect against baseline errors.

Stéphane GUILLOTEAU

Interferometer

Antenna 4

During what we expected to be the final tests, a serious problem occured in the quadrupod legs of antenna 4. The problem took very long to investigate, and has now been attributed to a (still unexplained, however) failure of the control system of the deicing of the legs. The electrical system had to be partially refurbished, and a new thermal control system designed and installed. Fortunately, the mechanical structure of the legs seems intact.

Because of this problem, however, antenna 4 went back into operation only on May 6, and final holography measurements have not yet been performed.

Observing Projects

Because of the unanticipated problem mentioned above, the schedule of Plateau de Bure observations is severely delayed. Moreover, explosion of a supernova in M81 has added one more project to the Plateau de Bure schedule. The weakness of the source (10-16 mJy) and the need to monitor its time variations required significant observing time.

Backends

Correlator chip failure report

LSI Logic, the manufacturer of our correlator chips, has just released the results of the failure analysis.

The probable cause is a metal void, developed after a complicated mechanism initiated by the presence of airborne carbon and silicon particulates during the wafer metallization process. A 16-page detailed, but somehow esoteric report is available.

This event has been identified and corrective actions were taken at LSI by mid-May 1991, a little time after our chips were processed...

Failures have been analyzed on 87 other customer chip designs of the same technology and manufacturing dates to get this conclusion. Analysis is a costly process and has not been run on our particular sample of failed chips. LSI logic believes that it is highly probable that the same cause will be found.

As they usually do under these circumstances, they will replace all the failed chips at no expense, and they apologize for the trouble caused.

Marc TORRES

Call for observing proposals on the 30 m telescope

The *next deadline* for the submission of observing proposals for the IRAM 30 m telescope is *Tuesday, June 1st, 1993* . Only proposals for 3 mm, 2 mm and 1.2–1.3 mm wavelengths (using heterodyne receivers or the IRAM 1.2 mm single-channel bolometer) will be considered. Accepted programmes will be scheduled between end of August and December 1993. Roughly 2000 h of observing time (200 max. on the bolometer) will be available for this period. Please find below some relevant information as well as a copy of the proposal form.

We plan a longer bolometer session in February/March 1994 and a short 0.8 mm heterodyne session in January 1994. Proposals for these two sessions should be sent only after the next Call for Proposals, which will describe the performances of the instruments, has been issued (deadline October 1st, 1993).

Applications

Your applications should be addressed as usual to

IRAM Scientific Secretariat,
300 rue de la piscine,
F-38406 St Martin d'Hères, France.

All proposals should have *reached* the Secretariat by *Tuesday, June 1st, 1993* , midnight. (Proposals sent by Fax will be accepted, provided they arrive by that time in a readable form; FAX (33) 76 51 59 38). Except for a duplicate of the source list (see below), no proposal should be sent by e-mail. You (i.e. the Principal Investigator) will receive by return mail an acknowledgment of reception and a proposal number.

To avoid the allocation of several numbers per proposal, send only one copy of your proposal, either by mail or by fax. In case your fax reaches us in time incomplete or unreadable, we will try our best to contact you (your responsibility, however).

To make the appraisal and the scheduling of your proposal easier, we ask you to use proposal forms of the enclosed model. Do not use characters smaller than 11pt, which would make your proposal unreadable if we had to fax it, e.g. to the members of the P.C.

On the title page, you must fill out the line 'special requirements' if you request 'service observing' or specific dates for time dependent observations (if there are periods when you cannot observe for personal reasons, please specify them here; beware, however, that they could be a motive for proposal rejection!).

We *insist* upon receiving with proposals for heterodyne receivers a complete list of frequencies *corrected* for source redshift (to 0.1 GHz, unless your frequencies are confidential). You should specify which receivers you plan to use. *Note that the use of the 2 mm receiver prevents use of the second 1.3 mm receiver 230G2, which, otherwise, can be used in parallel with receiver 230G1 (see below).*

If your source list is long (e.g. more than 15 sources), we would appreciate if you could send us a duplicate by e-mail to one of the following addresses:

- berjaud@iram.grenet.fr
- psi%0208038022556::berjaud
- iram04::berjaud

this will help us to keep up a computerized source list.

The scientific aims of the proposed programme should be explained in 2 pages of text, maximum, plus one page of figures and tables. Proposals should be self-explanatory, clearly state these aims, and explain the need of the 30 m telescope. The amount of time requested should be carefully estimated and justified (receiver performance is summarized below); it should include pointing, focussing, and calibration checks and allow for receiver tunings (on average 20 min. per receiver).

If time has already been given to one project but turned out to be insufficient, explain the reasons, e.g. indicate the amount of time lost due to bad weather or equipment failure; if the fraction of time lost is close to 100%, don't rewrite the proposal, except for an introductory paragraph. For continuation of proposals having led to publications, please give references to the latter. *In all cases, indicate on the first page form whether your proposal is (or is not) the resubmission or the continuation of a previously submitted 30 m telescope proposal.*

Service observing

To facilitate the execution of short (≤10 h) programmes, we propose "service observing" for some easy to observe (e.g. single source) programmes *with only one set of tunings.* The observing will be made by the IRAM staff, according to a pre-submitted observing plan (forms will be given when proposals are accepted). Please, if you are interested by this mode of observing, specify it as a "special requirement" in the proposal form (IRAM will decide which proposals will actually go to that mode). If you are located in Spain, France, or Germany, we will try to e-mail you, via IBERPAC, TRANSPAC, etc..., the `spectra.30m` files in quasi real-time; this excludes any intervention in the execution of the programme (see for more details below).

Programmes for the May 1993 – August 1993 period

One hundred two 30m telescope proposals were submitted for the deadline of February 1993. 34 proposals were rated "A", 28 "B", the others "C" or "D". About half of them will actually get time on the telescope, some, however, with less time than requested. The telescope schedule for May-mid June is made; the programme PIs have been or are notified. The July and August schedule will be published shortly.

Principal Investigators of scheduled proposals receive with the telescope schedule a *Confirmation of Observing Time* form which we ask you to return, properly filled, by Fax to IRAM Granada *and* IRAM Grenoble (attention Mrs. C. Berjaud). The list of frequencies to be observed (normally, the same as in the proposal) should arrive in Granada at least two weeks in advance. It is also only after reception in Grenoble of this form than we will send duly signed mission forms to those of you entitled to travel reimbursement.

If you have questions, please contact Mrs. C. Berjaud at IRAM Grenoble.

Note that the telephone number and FAX number of the Pico Veleta Observatory (i.e. the telescope site) are
Tel: (34) 58-48-02-11
FAX: (34) 58-48-08-60

Relevant Information about the 30 m Telescope

(Please, see updates and complements on the 30 m Telescope Status in this issue of the IRAM Newsletter).

Receivers

The following table lists the possible receiver combinations:

	Receiver Combinations					
Receivers	3-Rx		2-Rx			1-Rx
3MM-SIS	*	*				
Cont-3mm			*	*	*	
2mm		*	*		*	
230G1	*	*				
230G2	*			*		
Bolo						*

3 mm Continuum Receiver A cooled 2-channel receiver, operating in 1-channel mode with a Millitech Schottky mixer, is installed in line with the 4th mirror, behind the polarization rotator. This receiver can be used simultaneously with either the 2 mm receiver or a guest receiver.

The Continuum receiver can only be used for pointing. Continuum sources of ≥ 0.8 Jy (at 86 GHz) can be used for pointing checks; there are approximately 120 continuum sources catalogued. The Continuum receiver is normally aligned within $2''$ of the other receivers.

3 mm SIS receiver Tuning band: 85 - 116 GHz.

This receiver has been equipped with a new Nb junction mixer in August 1992. Its performances on the telescope are summarized in Fig. 1. The SSB receiver temperature is $\simeq$ 90K at 115 GHz. *Note that the IF frequency of this receiver is 1.5 GHz, and not 3.9 GHz as for the 1.3 mm and 2 mm receivers.* When tuned for the CO 115.27 GHz line in the LSB, the oxygen 118.75 GHz falls in the USB: system temperatures are lower therefore when using a large (> 15dB) USB rejection. Some results on the performance of this receiver are described in ref. [15].

Check your calibration on strong reference sources (see IRAM line catalog and updates [1, 10, 15]). Beware also of possible interference between the 'second' 1.3 mm receiver, 230G2, and this receiver when operating at harmonic frequencies (the two receivers share the same polarization; the interference will cause a strong and narrow line).

2 mm receiver Good and reliable performances over most of the band (see Fig. 2). Tunable from 130 GHz to 180 GHz (SSB receiver temperatures of 80 K to 150 K between 130 and 160 GHz and increasing to 300-500 K between 165 and 180 GHz).

1.3 mm heterodyne receivers

- 230G1:

  Operating band: 210 - 255 GHz in LSB (improved performances when rejecting the USB) and up to 267 GHz in the USB. Between 215 and 235 K, performances similar to or better than those of 230G2 (see below and Fig. 3). DSB temperature of 250 K at 266 GHz.

- 230G2:

  Operating band 215 – 235 GHz. Good performances over most of this band; USB rejection ($\geq$ 10 dB) possible (see Fig. 3).

The two 1.3 mm receivers and the 3 mm SIS receiver can be used simultaneously. Beware, however, of possible interference of 230G2's LO into the 3 mm receiver. Note that *the 230G2 receiver cannot be used with the 2 mm receiver.* The 2 mm and 230G2 receiver use the same control box; switching from one to the other is not straightforward and will not be made upon request. Please specify in the proposal form whether you choose to use the 2 mm receiver or 230G2.

At 1.3 mm a large fraction of the power radiated by the receiver horn is distributed in an error beam (which can be approximated by two Gaussians of HPW $\simeq$ 170" and 800"–see ref. 16 for more details). Astronomers should take into account this error beam when converting antenna temperatures into brightness temperatures.

The IRAM 1.2 mm single-channel bolometer will be available for 7–10 days at the end of November. Sensitivity is 70 – 100 mJy $\sqrt{s}$ by good weather – see ref. 12 for detailed description/performances.

General point about receiver operations: We urge observers to restrict their frequency lists as much as possible and to send them early to Granada and Grenoble.

For late arrivals (less than 2 week in advance) there is no guarantee for a prior test of the requested tunings.

Remote observing / Service observing

The telescope is controlled by the operator, assisted by the astronomer on duty, in the local as well as in the remote observing modes. The operator tunes the receivers (at least during night time) and is in charge of the supervision of the telescope; he has to leave occasionally the control room. During this time the astronomer on duty takes over. Remote observations thus require two persons at the telescope and are only possible for a limited number of hours. For safety reasons, direct access to the OBS/OBSINP telescope control programmes from outside is not allowed, except from IRAM Granada.

Remote observing using OBS/OBSINP is possible from the downtown Granada IRAM office, while keeping close contact with the operator/astronomer-on-duty via e-phone or other means. The RED data are on display. Short (few hours) proposals can be carried out this way by *experienced* observers. This mode of observation should be requested at least 2 weeks in advance.

"Service observing", with the PI staying at his home institute, is also possible upon request for some programmes (of less than 8 hours, with only one set of tunings and few sources or positions observed). Observations are made by the local staff (operators helped by astronomer on duty or by a member of the investigator's institute present at the telescope for his own observations). We will try to send you the `spectra.30m` data-files and the two pages of the OBS monitor if your computer allows it (Spain, France or Germany only, so far). This is a passive way of observing, no direct interaction with the telescope through OBS being possible. For this type of observation, we request an acknowledgement of the IRAM staff member's help in the forthcoming publication.

Backend

The spectral backend consists of 6 parts which can be individually connected to any receiver. See the 30-m Telescope Status for more details.

- The *1_1MHz* filterbank, consisting of 512 channels of 1 MHz (can be split into two halves and connected to two different receivers);
- The *2_1MHz* filterbank, consisting of 512 channels of 1 MHz (not splittable);
- The *100kHz* backend, consisting of 256 channels of 100 kHz (splittable into two halves movable inside the 500 MHz instantaneous bandwidth, or connectable to two different receivers; one of the halves can be connected to a spectrum expander with expansion ratios: 2, 4 and 8).
- The 500 channel *AOS*: bandwidth 500 MHz; actual spectral resolution 1.5 MHz.
- The *1_AUTO* new autocorrelator, consisting of 2048 channels (total band available: 20 MHz, 40 MHz, 80 MHz, 160 MHz) or 1024 channels (total band: 320 MHz, 500 MHz).
- The *2_AUTO* new autocorrelator, identical to *1_AUTO*.

Pointing / Focussing

Pointing sessions are made every one to two weeks; at present, the fitted pointing parameters yield an absolute pointing accuracy better than 3″ (r.m.s.). We also try to keep the receivers as closely aligned as possible (to about 2″, however, alignment can be lost by unknown reason). Check of the pointing and alignment is the responsibility of the observers (use a planet for alignment checks). Normally, the focus position can be monitored with the 3 mm Continuum receiver. Note that 230 G2 and 230 G1 have foci differing by 0.5 mm. Using both receivers, you should carefully monitor the focus and choose a compromise value. Not doing so may result in broadened beams (e.g. HPW 15″ and non-gaussian beams on one receiver [15]).

Wobbler

- Beam-throw: from 0 to 240″ on either side of the source (avoid small amplitudes).
- Phase duration: (standard) 0.5 s for continuum, 2 s for line.

Calibrated spectral lines

We are continuing a number of line calibrations at the higher frequencies (2 mm and 1.3 mm, similar to the Mauersberger et al. catalog) and calibrations for redshifted CO lines. These calibrations are made with precisely known rejections (see e.g. [2,9,10]).

References

[1] Receiver tests of the December 1990 technical period M. Guélin, H. Hein, S. Liechti, J. Cernicharo (Jan. 1991)

[2] Receiver tests during the April 1991 technical period S. Liechti, M. Guélin, H. Hein, A. Greve (June 1991)

[3] Thermal effects on the azimuth and elevation encoders J. Cernicharo, J. Penalver (Sept. 1991)

[5] Antenna test measurements at 350 GHz with the MPIfR Bolometer E. Kreysa, H. Steppe, C. Thum, J. Baars, R. Chini, A. Greve, G. Haslam, A. Sievers (Sept. 1991)

[6] Test of the 43 GHz receiver H. Steppe, A. Greve, H. Hein, T. Kampf, C. Kompe, A. Schmidt (Sept. 1991)

[7] Gain elevation curve and aperture efficiencies for the IRAM 30 m telescope
H. Steppe, R. Mauersberger, A. Greve, D. Morris (Sept. 91).

[8] Test of a 345 GHz open structure SIS receiver at the IRAM 30 m telescope
H. Rothermel, A. Greve, H.Hein, B. Lazareff (Nov 91)

[9] Meteorological conditions measured at the IRAM 30-m telescope
A. Greve, J. Penalver, W. Brunswig, B. LeFloch (Dec 1991)

[10] IRAM 30-m telescope receiver tests in December 1991
S. Liechti, M. Guélin, M. Carter, H. Hein, S. Navarro, B. LeFloch, A. Greve (Feb 1992)

[11] Bolometer array test
E. Kreysa, G. Haslam (May 1992 Newsletter)

[12] A facility bolometer for the 30m telescope
C. Thum, E. Kreysa, D. John, H.P. Gemuend, W. Brunswig, A. Greve, G. Haslam, R. Lemke, H.P. Reuter, M. Ruiz, A. Sievers, H. Steppe (Aug. 1992; see also May 1992 Newsletter)

[13] Holography of the 30 m telescope in July 92
D. Morris, A. Barcia, J. Garrido, H. Hein, G. Butin, A. Greve (Sept 92)

[14] Surface precision of the 30 m telescope
D Morris, A. Greve (Sept 92)

[15] Receiver tests during the August 1992 period
M. Carter, J.Y. Chenu, H. Hein, S. Navarro, A. Greve, M. Guélin (Sept 92)

[16] Appendix I: Error beam and side lobes of the 30 m telescope at 1.3 mm, 2 mm and 3 mm wavelength
in: Molecular Spiral Structure in Messier 51, S. Garcia-Burillo, M. Guélin, J. Cernicharo –IRAM preprint 285.

These reports are available under request (see also previous Newsletters). Please write to Mrs. C. Berjaud, IRAM Grenoble.

Michel GUÉLIN

Call for proposals for the Plateau de Bure Interferometer

Observing proposals are invited for the IRAM Plateau de Bure Interferometer (PdBI), for Sept 1, 1993 to Dec 31, 1993. The deadline for applications is *Tuesday, June 1st, 1993* . The available frequency range will be 81 GHz to 116 GHz.

Details of PdBI and operations are given in the document "An Introduction to the IRAM Plateau de Bure Interferometer". Proposers should read this document carefully before submitting any proposal.

Proposals should be sent to

IRAM Scientific Secretariat
Interferometer Observing Proposal
300 Rue de la Piscine
F-38406 Saint Martin d'Hères Cedex
FRANCE

IRAM expects to schedule and complete between 10 to 20 projects in this period, with an elapsed time of two months between start and end of any given project. Selection will be based on scientific merit, technical feasibility, and adequacy to the instrument.

For this call for proposal, please note the following:

- Number of Antennas *All the new projects will be carried on with 4 antennas*
- Configurations The exact configurations scheme is given in the "Interferometer" section of IRAM Newsletter (number 7, January 1993). The "CD" (compact) array is obtained with 3 configurations, and the "BC" (high resolution) array with 4 configurations, with two configurations in common. Authors *must specify and justify* the requested configuration choice. Combination of all configurations (BCD, 5 configurations in total), is possible, but must be even more justified.
- Coordinates and Velocities
  The interferometer will now operate in the J2000.0 system. For best positioning accuracy, source coordinates *must* be in the J2000.0 system; position errors up to $0.3''$ may occur otherwise.

  Please do not forget to specify LSR velocities for the sources. For pure continuum projects, the "special" velocity NULL (no Doppler tracking) can be used.
- New Correlator
  The correlator has 6 independent units, each being tunable anywhere in the 130-610 MHz band, and providing 4 choices of bandwidth/channel configuration: 160 MHz/64, 80 MHz/128, 40 MHz/256 and 20 MHz/256. For the 40, 80 and 160 MHz bandwidth, the two central channels may be perturbed by the Gibbs phenomenon (depending on continuum strength): it is recommended to shift the most important part of the lines away from the band center.

– Receivers
All receivers can be tuned in lower sideband with USB rejection of 5-8 dB. In this mode system temperatures (T_r^*) below 150 K for A #2 and A#3, and 180 K for A#1 (Trec 45 and 55 K respectively), are normally reached below 100 GHz. Higher rejections offer no gain in sensitivity. Accordingly, observations are preferentially done in LSB. If your want a double-sideband tuning (e.g. to observe one spectral line in each band), please specify it.

This LSB tuning is not possible above 113 GHz: these frequencies are available only in upper sideband.

– Sun Avoidance
For safety reasons, the sun avoidance circle has been extended to 35 degrees. Please take this into account for your sources *and* for the calibrators.

– Mosaics
The PdBI has mosaicing capabilities, but the pointing accuracy may be a limiting factor at the highest frequencies. Please contact S.Guilloteau in case of doubts.

– Data reduction
Proposers should be aware of constraints for data reduction:

  · In general, data will be reduced *in Grenoble*. Proposers will not come for the observations, but will have to come for the reduction.
  · We keep the data reduction schedule very flexible, but wish to avoid the presence of more than 2 groups at the same time in Grenoble. Please contact us in advance.
  · IRAM may consider splitting the data reduction in two phases: intermediate calibration and final mapping.
  · CLIC has been modified to handle the new correlator data. The new version is upward compatible with the previous, but the reverse is not true. Observers wanting to finish data reduction at their home institute should obtain an updated version of CLIC, which is now available.

Data reduction will be carried out on the dedicated HP workstation.

– Local contact
Depending upon the program complexity, IRAM may require an in-house collaborator instead of the normal local contact.

– Technical pre-screening
All proposals will be reviewed for technical feasibility before going to the program committee. Please help in this task by submitting technically precise proposals. Scientific justification should be kept within 2 pages.

– Non-standard observations
Please contact S.Guilloteau in case of doubt about non-standard program feasibility.

The documentation for the IRAM Plateau de Bure interferometer includes documents of general interest to potential users:

– "An Introduction to the IRAM Plateau de Bure Interferometer".
– "IRAM Plateau de Bure Interferometer: Calibration CookBook".
– "IRAM Plateau de Bure Interferometer: Mapping CookBook".
– "IRAM Plateau de Bure Interferometer: Frequency Setup"
– "CLIC: Continuum and Line Interferometer Calibration"

More specialized documents are also available; they are intended to observers on the site (IRAM on-duty astronomers, operators, or observers with non-standard programs):

– "IRAM Plateau de Bure Interferometer: OBS Users Guide"
– "IRAM Plateau de Bure Interferometer: Amplitude Calibration"
– "IRAM Plateau de Bure Interferometer: Flux Measurements"
– "IRAM Plateau de Bure Interferometer: Pointing Parameters"
– "IRAM Plateau de Bure Interferometer: Trouble Shooting Guide"

Stéphane GUILLOTEAU

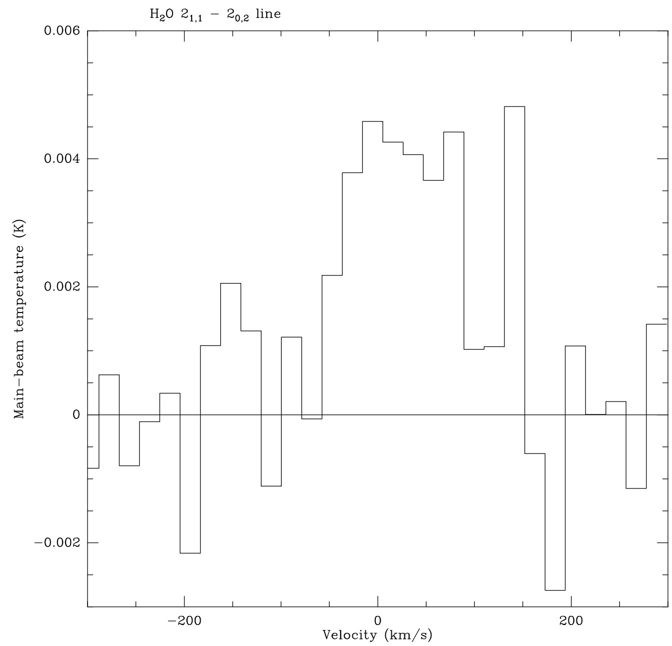

Figure 4: Reduced spectrum of the $2_{1,1}$-$2_{0,2}$ para line of H_2O at 752.0 GHz redshifted to 228.86 GHz towards the galaxy IRAS10214+4724 ($RA(1950) = 10h21m31.1s$, $DEC(1950) = 47°24'23''$). The velocity resolution is 20.96 kms^{-1} and the rms noise 1.8 mK. The spectrum shown here is the average of three independent data reductions

Scientific Results

Water at z=2.286 ?

Encrenaz P.J.[1,2], Combes F.[1,2], Casoli F.[2,1], Gerin M.[2,1], Pagani L.[1], Horellou C.[1], Gac C.[1]
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Abstract: We have used the IRAM 30m telescope to search for rotational lines of water and molecular oxygen in the very distant galaxy IRAS 10214+4724 at a redshift of 2.286. We report the tentative detection of the $2_{11} \rightarrow 2_{02}$ para transition of H_2O at 752.0 GHz. This would be the first time that a thermal rotational line of water is detected. The ortho transitions $1_{10} \rightarrow 1_{01}$ and $4_{14} \rightarrow 3_{21}$ at 556.9 and 380.2 GHz are not detected with intensities at most twice that of the detected 752 GHz line. We cannot derive the water abundance since the line is likely optically thick. Assuming that the levels are thermalized at 100 K, the filling factor of the H_2O emitting cores with respect to the total galaxy size of 8 Kpc is about 3 10^{-3}.

We have also observed three lines of molecular oxygen towards the same source, but detected none. Relative to H_2, this implies an abundance ratio $[O_2]/[H_2] \leq 3\ 10^{-4}$.

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282. The gas component in galaxies: atomic and molecular gas distributions
M. Guélin
1993, *Proceedings, Erice-Sicily 6-13 Sept. 92*

283. Dynamics of molecular clouds in M51
S. Garcia-Burillo, F. Combes, M. Gerin
1993, *Astron. Astrophys.*

284. Water at z=2.286 ?
P.J. Encrenaz, F. Combes, F. Casoli, M. Gerin, L. Pagani, C. Horellou, C. Gac
1993, *Astron. Astrophys.*

285. molecular spiral structure in messier 51
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