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hours to the IRAM infrastructure**

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1 Document information

Document name: Providing access of 214 (PdBI) and 662 (PV) hours to the infrastructure TNA IRAM in the period 01/07/2013 – 30/06/2014

Type Other

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1.1 Dissemination Level

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

1.2 Content

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2 Description of the TNA-IRAM deliverable

2.1 Information about the TNA – IRAM-PdBI

The Plateau de Bure Interferometer (PdBI) started in 1990 as a 3-element array. It is located in the French Alps, near Gap, at an altitude of 2550m. Since then, 3 more 15-m diameter antennas have been added, and today all 6 telescopes are equipped with low-noise heterodyne receivers for the 3mm, 2mm, 1mm and 0.8mm atmospheric windows. The SSB receivers provide a contiguous bandwidth of 4 GHz in each polarization. There is at present no other interferometer on the northern hemisphere that offers the same sensitivity at these wavelengths. With baselines up to 768 meters (in the East-West direction), it allows sensitive imaging at sub-arcsecond resolution (0.2-0.3 arcseconds at 1.2mm wavelength). The signals from the 6 antennas are processed by two IRAM-developed digital correlators, which allow a large variety of observing modes and the possibility to phase up all 6 antennas for VLBI experiments. Global VLBI experiments at 3mm wavelength together with the American VLBA and a number of European telescopes are performed twice a year. VLBI observations at 1.3mm were performed with the IRAM 30m telescope, APEX and CARMA (2014), and in the longer term experiments are planned that also use the ALMA antennas in Chile.

A major upgrade is currently underway. It will transform the Plateau de Bure Interferometer into a new qualitatively different and much more powerful instrument: the NOEMA interferometer. The project consists in doubling the number of 15m antennas (from 6 to 12), increasing the total IF of the receivers from 8 to 32GHz, and extending the East-West baseline from 0.8 to 1.6 km. The first NOEMA antenna, the construction of which is close to completion, is scheduled to start astronomical operation in the winter of 2014/2015. Together with the IRAM 30m telescope, the proposed enhancement will provide the scientific community with full access to all of the millimeter windows, from about 72 to 373 GHz, in the northern hemisphere, with a unique combination of two complementary facilities.

2.2 Information about the provided access to IRAM-PdBI (01/07/2013 – 30/06/2014)

For the current reporting period, a total of 210 proposals were received for the Plateau de Bure Interferometer with a considerable weight on extragalactic science. On the basis of scientific merit, 108 proposals were recommended by the Program Committee for observations with the PdBI. From these proposals, the Program Committee recommended 13 eligible projects that can be supported under the RadioNet3 contract to be scheduled at the PdBI during the Winter-2013 and Summer-2014 semesters. The total observing time allocated to eligible proposals during the current reporting period corresponds to 214 hours. In Total, 60 users from TNA-eligible institutes, distributed over 10 projects, benefited from this telescope time.

The list of recommended eligible projects for which time was allocated and the associated number of observing hours are given in a table below.

Project acronym	Name (institute) of the TNA user group leader	Number of the TNA users	Provided access [hours]
Provided access to the IRAM – PdBI:			
W0AA	James Simpson (Durham University, UK)	14	17
X004	Susanne Wampfler (Starplan, Copenhagen, DK)	4	13
X--3	Miroslova Dessauges-Zavadsky (Geneva Obs, CH)	6	13
X033	Mark Swinbank (ICC, Durham, UK)	6	42
X04A	Karina Caputi (Groningen University, NL)	9	22
X060	Audrey Coutens (Niels Bohr Institute, Copenhagen, DK)	4	8
X065	Magnus Persson (Leiden Observatory, NL)	5	21
X067	Agnes Kospal (ESA/ESTEC, Noordwijk, NL)	4	25
X08F	Susanne Aalto (OSO, Onsala, SE)	3	18
X0C6	Rob Ivison (ATC/ROE, Edinburgh, UK)	5	35
PROJECTS: 10		USERS: 60	ACCESS: 214 hours

The detailed information about the committee providing access, projects and selection is given in the TNA database of the 2nd periodic report.

2.3 Information about the financial EC contribution to the travel to IRAM-PdBI

The table below provides the estimated amounts of reimbursement for travel costs incurred in the reporting period July 01, 2013 to June 30, 2014 by users eligible for RadioNet support.

Due to the high request for financial support during this period, and our will to keep the TNA spending in line with the budget allocated to IRAM relative to the other TNA partner institutes, it was decided to limit the TNA reimbursements to the traveling expenses only.

Following up on a recent assessment of the TNA travel budget, it was decided to withdraw the limits on the reimbursement of travel and accommodation expenses incurred by users of the PdBI as of January 01, 2014 (see D18.1).

The travel budget is allocated by the RadioNet3 beneficiary No. 5 (JIVE). Therefore, the exact numbers will be presented by JIVE in the periodic report.

Project acronym	Person name (institute)
X004	Susanne Wampfler (Starplan, Copenhagen, DK)
X04A	Karina Caputi (Groningen University, NL)

2.4 Information about the TNA IRAM-PV

The 30-m telescope, located at an altitude of nearly 3000m on the Pico Veleta in the Spanish Sierra Nevada, has been designed with a surface accuracy and a pointing capability for observations in the atmospheric windows at 3, 2 and 1 mm. Occasionally the telescope is even used at 0.8 mm during particularly favorable atmospheric conditions.

While other telescopes exist in Europe that can observe in the 3mm atmospheric window, e.g. the 100m telescope in Germany, the Onsala telescope in Sweden, and the Metsahovi telescope in Finland, and while European groups operate (sub-)mm-telescopes like APEX in Chile, the IRAM 30m telescope is by far the most sensitive in its wavelength range. It offers unique observing capabilities through the simultaneous availability of several low-noise heterodyne receivers (EMIR), a 18-channel heterodyne array (HERA) and a 2mm bolometer camera with 128 closed-packed pixels (GISMO). The heterodyne receivers can be connected to a variety of analogue and digital backends that allow spectroscopic studies at resolutions between 3.3 KHz and 4 MHz. One of the backends (XPOL) is capable of making cross correlations, a feature which is used for polarization observations. In the current reporting period, we have added a new continuum camera to this suite of instrument. The prototype camera NIKA has been tested at the 30m telescope on several occasions since 2009, and it was finally opened to the community in winter 2013/2014. NIKA is equipped with two focal plane arrays observing simultaneously in the 1mm and 2mm atmospheric windows. These arrays are based on a new type of detectors, namely Kinetic Inductance Detectors, or KIDs, that until NIKA had never been used in astronomy before. The performances attained are already very promising and competitive with other instruments such as MAMBO (the former continuum camera of the 30m telescope) or BOLOCAM at the CSO telescope. The full instrument, called NIKA2, will be installed at the 30m telescope in Autumn 2015, which will require a modification of the optical elements in the receiver cabin to feed the 6.5 arcmin field-of-view of this new camera. NIKA will have about 5000 pixels and it will offer polarimetric capabilities in the 1mm band.

The telescope is also equipped with a Mark IV VLBI terminal, and VLBI experiments at 3, 2 and 1.3mm wavelengths have successfully been carried out in recent years. By combining the 30m telescope with the 15m diameter antennas on the Plateau de Bure Observatory, it has indeed been possible to detect for the first time fringes with high signal/noise ratio in a VLBI experiment at 1.3mm. The 30-m telescope is also very well suited and often used for complementing interferometer maps with short spacing information.

2.5 Information about the provided access to IRAM-PV (01/07/2013-30/06/2014)

For the current reporting period, a total of 249 proposals were received for the 30m telescope with a well-balanced distribution between extragalactic and galactic science. On the basis of scientific merit, 185 proposals were recommended by the Program Committee for observations with the 30m telescope. From these proposals, the Program Committee recommended 16 eligible projects that can be supported under the RadioNet3 contract to be scheduled at the 30m during the Winter-2013 and Summer-2014 semesters. The total observing time allocated to eligible proposals during the current reporting period corresponds to 662 hours. In total 99 users from TNA-eligible institutes, distributed over 21 projects, benefited from this telescope time.

The list of recommended eligible projects for which time was allocated and the associated number of observing hours are given in a table below.

Project acronym	Name (institute) of the TNA user group leader	Number of the TNA users	Provided access [hours]
Provided access to the IRAM-PV			
027-13	Izaskun Jimenez-Serra (ESO, EU)	5	32
033-13	Julien Montillaud (University of Helsinki, FI)	6	27
044-13	Maria Teresa Beltran (INAF-OAA, IT)	4	4
060-13	Sofia Wallstrom (OSO, SE)	6	10
063-13	Timothy Davis (ESO, EU)	13	42
064-13	Helmut Dannerbauer (Universitat Wien, AT)	5	52
070-13	Nicola Brassington (University of Hertfordshire, GB)	5	76
075-13	Breezy Ocana Flaquer (CAUP, PT)	3	22
081-13	Breezy Ocana Flaquer (CAUP, PT)	2	36
083-13	Christopher Harrison (Durham University, GB)	7	41
086-13	Miguel Pereira Santaella (INAF-IAPS, IT)	3	45
092-13	Viviana Casasola (INAF, IT), Laura Magrini (INAF-OAA, IT)	6	32
097-13	Alastair Edge (Durham University, GB)	10	2
151-13	Luca Bizzocchi (CAAUL, PT)	2	33
172-13	Attila Moor (Konkoly Observatory, HU)	3	5
174-13	Attila Moor (Konkoly Observatory, HU)	3	1
185-13	Timothy Davis (ESO, EU)	2	54
197-13	Frank Israel (Leiden Observatory, NL)	2	23
214-13	Timothy Davis (ESO, EU)	4	57
224-13	Wim Ubachs (VU University Amsterdam, NL)	4	33
034-14	Alessio Traficante (Jodrell Bank Centre for Astrophysics, GB)	5	35
Total : 21		Total : 99	Total : 662

The detailed information about the committee providing access, projects and selection is given in the TNA database of the periodic reports.

2.6 Information about the financial EC contribution to the travel to IRAM-PV

The table below provides the estimated amounts of reimbursement for travel costs incurred in the reporting period 01/07/2013 – 30/06/2014 by users eligible for RadioNet support.

Due to the high request for financial support during this period, and our will to keep the TNA spending in line with the budget allocated to IRAM relative to the other TNA partner institutes, it was decided to limit the TNA reimbursements to the traveling expenses only. Following up on a recent assessment of the TNA travel budget, it was decided to withdraw the limits on the reimbursement of travel and accommodation expenses incurred by users of the 30m telescope as of January 01, 2014 (see D18.1).

The travel budget is allocated by the RadioNet3 beneficiary No. 5 (JIVE). Therefore, the exact numbers will be presented by JIVE at the periodic report.

Project acronym	Person name (institute)
027-13	Jonathan David Henshaw (ESO)
060-13	Sofia Wallström (Onsala Space Observatory)
063-13	Timothy Davis (ESO)
064-13	Helmut Dannerbauer (Wien University)
070-13	Nicola Brassington (Hertfordshire university)
083-13	Christopher Harrisson (Durham University)
092-13	Laura Magrini (INAF, Arcetri)
151-13	Luca Bizzocchi (CAAUL, Lisboa)
185-13	Timothy Davis (ESO)
224-13	Wim Ubachs (Amsterdam University)
034-14	Traficante (Jodrell Bank Center for Astrophysics, GB)

Appendix

The table below provides the estimated amounts of reimbursement for travel costs incurred in the reporting period 01/07/2013 – 30/06/2014 by the members of the IRAM Program Committee:

Date and Location	Person name (institute)
April 9-10, 2014 - Granada	Andrew Blain (University of Leicester, UK)
April 9-10, 2014 - Granada	Romeel Davé (University of the Western Cape, Cape Town, South Africa)

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