

# Minutes of the October 4<sup>th</sup> 2012 meeting for the preparation of the 5<sup>th</sup> run of NIKA at Pico Veleta

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Participants:

Néel: AB, AM, MC,

IPAG: FXD, NP

LPSC: JMP, AC, RA

IRAM Gre: SL, RZ, GC

IRAM Gra: NB, CK, AS, SN, WB

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## Minutes

The text in bold characters highlights the main items of the discussions.

*The text in bold italic red = tasks to do before the run.*

- **Early cool down during GISMO run:** Too complicated to come on Tuesday 6<sup>th</sup> of November and change the array, because of limited room and possible disturbances when stopping the ongoing GISMO run. Nevertheless, it's OK that **Alessandro and Martino** arrive on Thursday evening in Granada (meet Carsten on Friday morning), and go to the telescope on **Friday 9 morning to start cool down** few days in advance. If the road is still open they may drive directly to the telescope, if the road is closed they would use the regular IRAM transport (10H30 at the telescope). One room might be available over the week-end so that they could stay to monitor the cool down and be close to the instrument in case of problem. If no room available: they will probably stay in a hotel in pradollano (or in Granada, which is easier for communication with the telescope). They will need **30 min in the beam to start the cool down in the morning, plus 30 min possible in the afternoon in case of problem.**
- Hardware to be brought by the NIKA team: **electronic rack (~1m tall), leak detector (if not already bought by IRAM Granada), computers.** Note: the electronics will be the novelty of this run: 1<sup>st</sup> time that the NIKEL electronics will be mounted at the telescope; more pixels should be available compared to previous runs.
- Lodging: **3 rooms will be available for the NIKA team (non IRAM persons) for the whole run.** There will be 2 groups; one per week, with 1 day overlap between the 2 teams.
- **Schedule** of the run (from Nicolas Billot email):
  - NIKA will run as is, no need to interrupt the GISMO run to install a new array.
  - Friday 9th Nov.: Alessandro and Martino go to Pico, start cooling down.
  - If vibrations and magnetic fields generated by NIKA interfere with GISMO, stop cool down, and start again on Tuesday 13th during the maintenance.
  - The NIKA run starts no earlier than Wednesday 14th in the evening.
  - Until Tuesday 20th, **7 hours per day** are allocated to NIKA (<http://www.iram.fr/IRAMFR/PV/sche/12/s45v1.html>).
  - Nov. 20-27: About **16 hours per day** will be allocated to NIKA.
- *Santiago will check if the He lines connector adaptor is still at the telescope.*

- The Néel group sent the NIKA network computers to Granada yesterday (addressed to *Walter*): there's **2 computers rack + a Mac + a Switch**; everything is already connected together, so the only action needed to make the system available on line is to *connect the power cord + the internet cables to the CISCO router*. It would be nice to plug them as soon as possible without unplugging the old system so that the NIKA team can test the new system, while having the old one in backup in case of problem. Everything run on the NIKA local network, and the IPs have been set so that there must be no conflict.
- After the run, the electronics will be brought back to Grenoble for upgrades.
- It would be nice to have *another IRAM RF source staying at Pico* with possibility for external frequency modulation. → *Santiago will check* if there's one available in Granada, *otherwise Samuel* will see in Grenoble if another source can be borrowed on a long term (it should stay at the telescope for few years).
- **Frequency Tuning**: the feedback NCS-Camadia will not be possible for this run. Should not be a problem since the auto-tuning between subscans is not for this run either. However there will be a tuning at the **beginning of each scan**, preferably off-source but close; so for example at the corner of the map, right before the beginning of the 1<sup>st</sup> subscan. **Few seconds** are necessary for this new tuning procedure. *Walter will check the delay between* the flag *antMD.Prepared*, send by NCS when the telescope arrives in the vicinity of the source ( $< 1'$ ), *and antMD.BackOnTrack*, send when the subscan really starts.
- For **focus**: It would be good to go **off-source**, make the tuning and calibrate the **0 level power**, then map the source, then off source again (so get the variation of the 0 level power during the map).
- Robert: but in **PaKo** the **Map command** allows this! Its default use is making an off-source calibration, then the measure on source, then off-source again; this is used every day by the heterodynes (it's only with bolometers that the possibility to not do the off-source calibration had been introduced). → This is exactly what we want, but it's not sure that there's a message in Elvin to flag the start and end of the off-source part of the map. In case this is not available for the run, one possibility (suggested by Walter) would be to include in a PaKo script a shell command creating a file that can be used as a **flag for the calibration part**. Juan MP will look at how to use this possibility (create a file or a simple broadcast) for the synchro with the NIKA software.
- For **Sky Dips**: a tuning is needed between subscans (airmass steps), but there is no BackOnTrack when the telescope is in tip mode, however **SubscanStart** can be used: when it is sent few seconds are available during which the NIKA calibration sequence can be done.
- Alessandro: the calibration at each scan must be the default; it's only rarely, for testing reasons that we might want to not doing it. → OK, but for this run no new modification in PaKo is possible, so use scripts.
- The NIKA team would like to **connect the computers to do tests before the run**; they would grab the NCS information from other users to test the merging programs in Grenoble and broadcast on the NIKA local network at the telescope (so not on the IRAM network).
- **Pointing model**: start with a pointing model copied from another instrument, do 1<sup>st</sup> **calibration** scans, then perform a **pointing session** doing crosses for few hours on sources covering the whole sky. Typically observe ~30 sources: quasars and secondary calibrators used for MAMBO. We need good weather for this. Then

calculate and **implement the pointing model**. Then **calibrations again with focus, beam map** etc. Then **iterate** the full procedure since pointing and focus are interdependent.

- Nor Robert neither Xavier will be at the telescope on the 1<sup>st</sup> week when the characterization and calibration sequences are foreseen. The only expert on calibration present will be Albrecht → **Samuel can come on the 1<sup>st</sup> week** and help for a better interaction between instrument experts, on site calibration and people working remotely on processing like Robert and Xavier. It's important that this **calibration / problems characterization** work sequence is conducted as best as possible; e.g. the “plateau” is a big problem for calibration, so also for measurements even on faint sources were it doesn't exist. Robert: if we don't solve this “plateau” problem we can do astronomy but not astrophysics!

- The NIKA team has a **very nice array in lab**: good **cosmetics, homogeneous resonances**, and maybe less problems like the “plateau” (which may be intrinsic to the arrays themselves after all)... **but not the best sensitivity**. Now Néel can test the “plateau” in lab thanks to a new chopper; no plateau is seen on the new array, and the run 3 array (which had a big “plateau”) will be checked next week.

- → **If needed the NIKA team could go on the telescope on October 16<sup>th</sup>** during the maintenance **to change the array** currently on site with the new one that has no “plateau” and the best cosmetics; in case of problem the arrays could be switched back during the next maintenance on October 23<sup>rd</sup>. The decision will depend on the lab tests this week and the next week; though most probably we will keep the current array.

- **Goal for sensitivity: maps < 1 mJy 1  $\sigma$  rms**. If problems with the plateau still there: concentrate on compact faint sources, which are the less damaged by this effect.

- There will be **no wobbler** tests (previous runs calibrations indicate that if it has an advantage it would be only for focus, and the use of pixel neighbors instead of wobbler may even be sufficient to reach and even exceed the quality of the wobbler method, so postpone the final proof comparison test, we have too many more urgent things to do first)

- There will be **no 8Hz slow loop** implemented for this run; maybe available in 2013.

- **Training of IRAM personnel: pump, leak test, re-fill nitrogen**. Santiago is interested also on learning how to **operate the detector** / system cooldown. Alain is OK for learning, and teach to interpret curves and indicators, but warn that **nobody except cryogenics expert from Néel will intervene in the cooling process**; dilution is too delicate and it's too easy to screw up things, and anyway this will eventually be fully automated in the future.

- *Xavier will email Albrecht for computer space, where to write on disks* etc.

- The *IMBFITS* should keep the same structure as the previous run except that there might be another column with **tuning information** such as the frequencies. Robert: attention if there's new data in the IMBFITS this might be a problem for MOPSIC, and it's a bit late to change things. → *Xavier, Juan MP, Robert and Albrecht will communicate and do tests in the coming weeks.*

- Last remark: the **pointing session must not be done before at least 2 hours after sunset... and neither before plateau investigation, focus, geometry.**