

Summary notes of Meeting on KID/Bolo Camera Inst Neel

Date 17.3.09; 9:00-11:45

Location: IRAM

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Edt: KS/SL

Short description of project:

Institute Neel has developed a compact Bolometer Camera platform for the IRAM 30m telescope which is based on a He dilution refrigeration system and which can integrate different types of focal plane detectors. It is planned to make first tests of this system with detectors and filters in 2mm band at the telescope this summer. The two most likely detector types are KID detectors with frequency multiplexing and NbSi bolometers using time multiplexing readout.

Technical questions:

Discussion of differences in approach Bonn/SRON and CASPER/Berkeley.

KS: need to understand impact of sampling depth (nr of bits) on : dynamical range, noise and max number of multiplexed pixels.

AB: Neel will work on small board to understand fundamental questions and software design which will allow to judge developments abroad.

IRAM will try to help with HDPE filters, lenses and windows as well as with mirrors as much as possible. NEEL sends drawings to S. Leclercq.

The compatibility of the proposed mechanical structure of new mirrors and cryostat with the current M5-M6 tower and the anti-vibration optical table should be validated by next month.

NEEL will do a standalone data acquisition with minimum interfacing. Preferred mode is a simple online communication of telescope position (dtim < 100ms, ~every 1) and a hardware TTL signal for chopper. IRAM will provide information on these possibilities within the next 3 weeks.

Organization of summer test run:

During the meeting IRAM has indicated to foresee a period of three weeks in August 09: 1 week of installation (8h daytime), 1 week of on-sky tests (10h day time) and in case of successful installation and second week a third week of test with night time (10 h). The exact date is not yet fixed but usually scheduling is done from Tuesday to Tuesday. This planning is pending on the pressure factor which will be analyzed within the next 3 weeks and might be subject of revision*. The definition of the team is not yet, done but IRAM does not foresee to lodge more than 8 external persons at a time.

The test-run at the 30m will be reconfirmed at latest on the 15th of June. Up to this date the NEEL group will show readiness, and on this purpose a meeting will be held. The conditions for readiness are:

- Working array with a minimum of 32 pixels contained in a single attached block or area with a sensitivity required to do useful tests and first light science. The procedure how to measure noise performance and sensitivity in the lab and the translated requirements will be worked out between Inst NEEL and IRAM (S. Leclercq) within the next 6 weeks. Preliminary frequency range of optimization is 1-20 Hz, noise spectra will be taken for a statistically significant number of pixels.
- Optical measurements which show: that the internal optics is working according to the design goals and that no stray-light problem exists and a valuable illumination of the telescope will result (optical filters ready, XY maps with chopper, secondary lobes).
- Sufficient preparation of instrument control and mapping software to avoid down time during telescope tests.
- Only hardware which has been successfully tested in the laboratory can be employed at the telescope.

Slipping is not foreseen but rescheduling on a later date (min shift 1 month) might be possible.

Cryogen needs foreseen is ~8 bottles of 100 liters.

List of sources for observations prepared and agreed in advance: merging propositions from NEEL group and collaborators, and from IRAM staff.

Next meeting:

including SRON, Cardiff and Bonn; if possible still in April. KS availability 23rd April and 4th or 5th May.

* After the deadline for 30m summer proposals, IRAM has realized that the pressure factor for this period is very high. The semester will be also short due to the required commissioning time for EMIR, the new broad band single pixel receiver. IRAM therefore proposes to shorten the installation period with the following scheme:

- Friday 14th of August to Tuesday 18th of August: full daytime access to receiver cabin for installation.
- Tuesday 18th of August to Tuesday 25th of August: full daytime access to telescope in case of successful first week =>
- Tuesday 25th of August to Tuesday 1st of September: full night time access to telescope. The Mambo place should be cleared on the 1st of September in the afternoon.