SPIRE-PACS Instrument Collaboration

Letter of Agreement

between ATC, Royal Observatory Edinburgh and MPIA, Heidelberg

Based upon the agreed cooperation between the SPIRE and PACS instrument consortia as constituted in the signed blanket insurance between the two PI institutes, this contract regulates in detail the concerns between ATC (Edinburgh) and MPIA (Heidelberg). In compensation for the exchange of know-how and the provision of hardware concerning the far infrared filters for PACS, as described in another contract between QMW (London) and MPE (Garching), MPIA will provide ATC in return with know-how and materials for the SPIRE beam steering mechanism (BSM). Since this contract is fixed upon the schedule for the whole collaboration, it expires also at the end of 2003, but may be renewed if both parties agree.

In detail, the contract assigns the following designated duties to MPIA:

- Provision with supporting documents of ISOPHOT resp. PACS chopper design
- Support on the BSM design including numerical electromagnetic simulations (MAFIA)
- Delivery as well as manufacture of critical components and materials available from the PACS chopper (ATC will pay for manufacturing dedicated components)
- Free distribution of given and future test results concerning performance and qualification
- Support of ATC by participating in design and other relevant BSM project reviews, if invited

ATC, on the other hand, is invited to:

- perform all the necessary experiments by using the cryogenic test equipment at MPIA
- participate on informal PACS chopper review meetings

In order to optimize the flow of information within the cooperation , the participating parties shall organize periodical bilateral meetings as well as exchange information via the available info networks. The trips will normally be paid by the home institutes.

Date:

SPIRE	PACS
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ATC, Local Manager	MPIA, PACS-Co Investigator

Beam Steering Mirror: MPIA-ATC collaboration.

Following our brief discussion at Saclay, I am providing this brief note to agree areas of a collaboration between the SPIRE/ATC and PACS/MPIA project teams.

The baseline design of the drive mechanisms for the Beam Steering Mirror (BSM) for SPIRE is based very much on the MPIA design for the ISOPHOT chopper. Therefore, advice from MPIA would be invaluable in replicating this space-qualified and flight proven design.

The PACS team have also put significant work into improved motors which may also be useful for SPIRE. This is particularly true as additional torque delivery may be required to implement the preferred redundancy modes of the current BSM design.

The areas of interest to the BSM team are then:

A. ISOPHOT chopper

1. The BSM team require detailed design and manufacturing information to enable a development motor set (at least 4 motor coils) to be built for baseline laboratory tests of the BSM prototype. It appears most of this information rests with Zeiss.
2. As no off-the shelf motors remain from ISOPHOT, then either:
   - Contact details for the original manufacturer (Zeiss) to enable BSM to purchase 2 additional motors.
   - Or to obtain sufficient design details (from Zeiss or MPIA) to allow a faithful replica to be manufactured by the ATC (or a UK contractor).
3. How can we best progress the MPIA modelling and optimisation of the ISPOHOT magnetic circuit?

B. The PACS chopper

The initial questions here are aimed at evaluating whether the PACS design, or elements of it would be useable in the BSM without a major re-design of the BSM mechanism.

1. Could MPIA provide ATC with the size envelope of the PACS motor (mechanical and electrical space envelope drawings). This would allow ATC to model the space required for the PACS motors and evaluate whether they would fit into the current BSM design.
2. Similarly to B1, could we obtain drive electronics and shielding requirements to assess compatibility with the BSM design?
3. If it is shown by (B1,2) that the PACS design will not fit into the BSM, then can we consider collaboration on use of some elements of the PACS design, for example:
   - Scaling or re-packaging of the PACS motor to fit the BSM
   - Use of the improved PACS materials (windings, cores) within the ISPOHOT design to increase torque delivery.
   - Collaboration to assist in modelling and optimisation of the PACS circuit in this fashion?
4. Do PACS intend to re-use the ISPOHOT design for magneto-resistive sensors? If so, collaboration on purchase of components would be attractive (BSM will require 16-24 such devices).

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