Appendix C

Summary of RSC core and additional functions: user's perspective

Leonardo Testi, September 2003

During August 2003, an ESAC subgroup consisting of P. Cox, J. Richer, P. Schilke, L. Testi (chair) and E. van Dishoeck prepared a draft document on the European RSC core and additional functions as seen from the user's perspective, with the aim to provide a description of these functions which goes one level deeper than previous ASAC, ESAC and project reports. This document was discussed at the Madrid ESAC meeting, and a preliminary ranking of the additional functions was made. The updated version of this document is presented here.

As discussed in §IV of the ESAC report, the core functions are to be funded and controlled by the ALMA Observatory and need to be ratified by the ALMA Board. The additional functions are not funded by ALMA, but are believed to be critical to achieve the full scientific potential of ALMA. In the ESAC discussions, it became clear that better names for these two sets of functions are needed, which express their respective roles. Suggested alternative names include 'Observer's support' or 'Data handling support' for the core functions, and 'Science support' or 'Science-enabling' for the additional functions.

I. Core functions

- **Proposal Preparation (Phase I) Support**
  - Distribution and technical help for Phase I software
  - Provide access to archive of old and ongoing projects (to help avoid duplication)
  - Scientific/technical consultation for feasibility issues
  - Proposals administration (receive, organise review, collect results)
  - Support and organisation of Time Allocation Committee work
- **Observation Preparation (Phase II) Support**
  - Distribution and technical help for Phase II software
  - Scientific/technical consultation for Phase II preparation
  - Validation of Phase II material: technical check that confirms the approved program, and whether or not there is duplication with old projects (this may be allowed in some cases by the TAC but should generally be checked)
  - Support during observations
    * ALMA-Chile may need to contact the user in case of problems with his/her project. In the initial phases of ALMA it would be good to have a direct interaction Chile-user-Chile, at least with the more advanced users during the interim phases; at later times such interactions may go through the RSC.
    * The user may want to contact ALMA regarding his/her project after checking the results of the quick-look pipeline when these will be available. It is possible that this interaction may be done with Chile in the initial phases and that it will be handled through the RSC at later stages
    * Interaction at 'breakpoints'. When a breakpoint is reached, ALMA-Chile will inform the user through the RSC in a timely manner. It is then a responsibility of the user to react to the breakpoint, possibly submitting new/modified Phase II through the RSC.

- **Data Analysis Support**
  - Distribution and technical help for [pipeline and] offline Data Reduction Package
  - Scientific/technical remote advice on data reduction and calibration

- **Science Archive Operations Support**
  - Archive research support (via local copy or fast link)
  - Distribution and technical help for archive research tools
  - Relationship with the Virtual Observatory (in coordination with the ALMA Observatory and all other RSCs)

II. Additional functions

Preliminary ESAC priorities are indicated: 1=essential; 2=high priority; 3=desired

- **Advanced Archive and Data Reduction Operations**
  1. Support of users visits to the RSC to reduce and calibrate the data
  2. Computing resources for remote data reduction and calibration
     - ∗ Archive users may require reprocessing of old data using a new version of the pipeline or using a modified data reduction recipe. This 'standard' reprocessing should be handled by the RSC and the user should obtain pipeline processed data as a result of the Archive request
  3. Remote pipeline re-processing of large sets of archival data

     ∗ Some archival projects may require reprocessing of large amounts of data, possibly using a new/modified recipe developed by the user. The RSC should support the possibility of integrating new recipes in the pipeline, if considered appropriate, and provide the computing resources for these large data volume reprocessing
  3. Remote advanced simulations and associated pipeline reduction
     - ∗ Support at facility for advanced simulations using the ALMA simulator and the related 'standard' processing of the simulator output data sets (e.g., using the same pipeline as for the real data)
  3. Advanced science tools
     - ∗ Sideband deconvolution of DSB single-dish data, radiative transfer models, molecular data and line lists

- **Software Development and New Techniques** (in coordination with other RSCs and ALMA Observatory)
  1. Development of advanced data reduction algorithms and scripts
     - ∗ Develop new software recipes and support integration within the ALMA software of new algorithms developed by the community
  2. New data handling and archiving concepts
     - ∗ Develop, test and implement next generation data transfer and archive concepts (if appropriate)
  2. Development of new/advanced data flow concepts

- **Special Projects Support**
  3. Public surveys
     * Identify, in consultation with the community, possible large survey programmes and perform the related observations, data processing and dissemination. Data for these types of programmes will be reduced in a timely manner by the RSC and will be made public immediately
  3. Support for Special and/or Key and/or Legacy-type projects
     * Provide technical, scientific and software support for the preparation and execution of large programmes defined and operated by external (to the RSC) consortia (as opposed to public surveys, which are mainly/only internal projects)
- **Scientific Community Development and Scientific Support**
  1. Internal postdoctoral fellowships
     * Support postdoctoral positions at the RSC (these position may have a fraction of duty time, similar to the ESO fellowship programme).
  1. Organization of training programmes and schools
  1. Organization of conferences and workshops
  1. Organize workshops on next generation ALMA hardware/software
     * These are supposed to get the community together in order to identify scientific and technical priorities for new hardware and software developments
     * Help to organise consortia within the community to respond to ALMA next generation hardware calls for proposals. This activity will be done in connection with other forums such as RADIONET or OPTICON
  3. External postdoctoral fellowships
     * Support postdoctoral positions at institutes outside the RSC within the community (similar to the Hubble Fellows) or through EU framework programmes
- **PR and Outreach Activity**
  3. The RSC will have an active role in stimulating the user community in preparing material for outreach activity, which will be coordinated at a project level