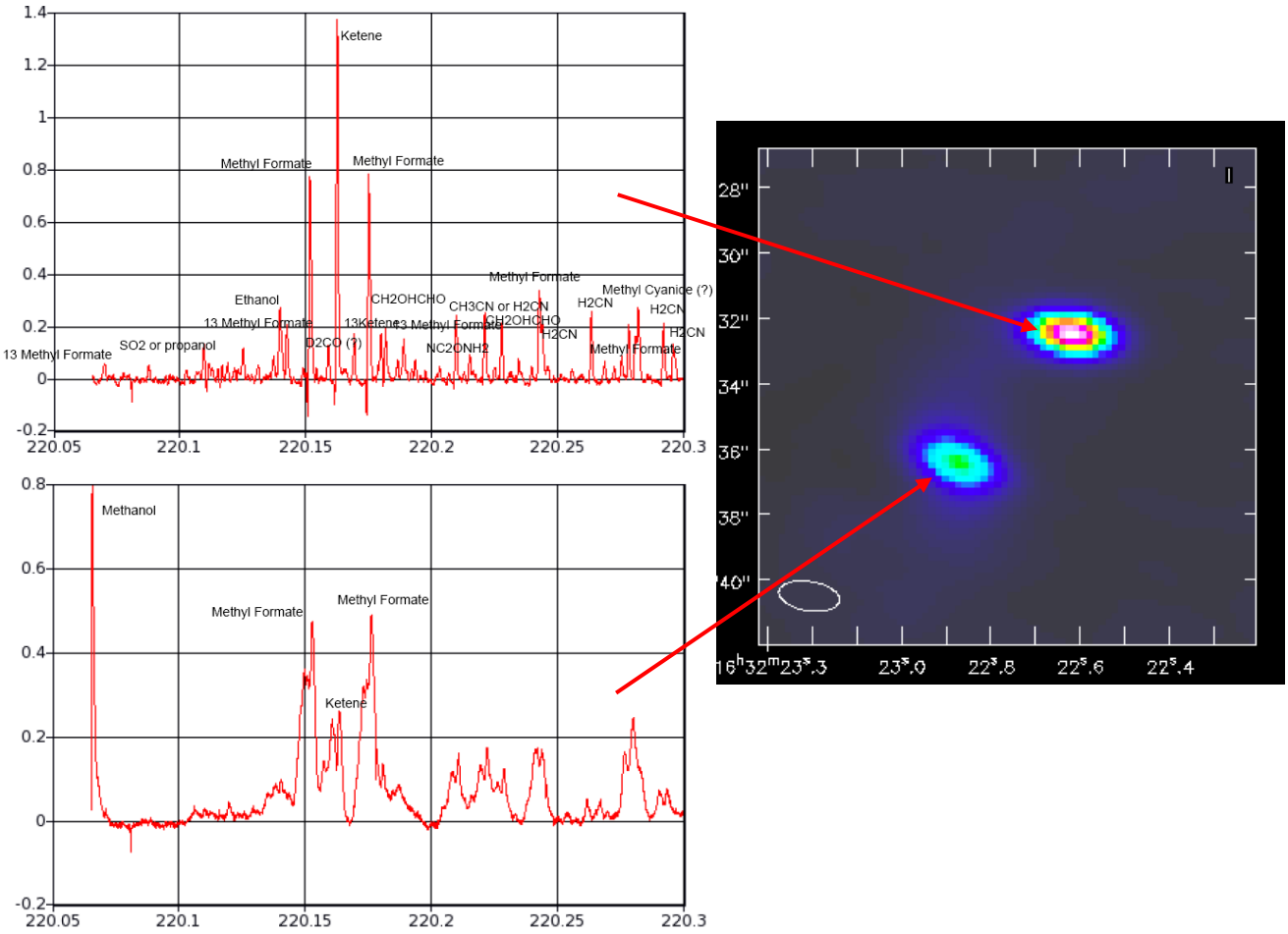
9. SCIENCE IPT

9.1 Commissioning and Science Verification

The pattern of alternating blocks of time for Early Science observing and commissioning activities continued. Conditions have generally been good in terms of both opacity and wind speeds. As is now becoming the pattern, a significant fraction of the CSV time and effort was taken up by checking out new antennas and the associated equipment and then integrating them into the array, as well as re-integrating antennas that had been moved or had repairs done to them. These processes are now quite quick and efficient, but we are trying to refine them further and to incorporate into them the final stages of AIV testing – items such as Band 9 tests which cannot be done at the OSF.

The major element of new work was a campaign focussed on single-dish observing which took place from the 6th to the 14th Nov. A good deal of progress was made on this and small spectral-line maps were produced successfully with both the 64-input and ACA correlators. Attempts to make larger maps were, however, almost always stymied by failures which were reported as problems with the Local Oscillator system. We believe that these were in fact a result of the communications problems between software components described below. Later in the month we were able to make rather larger maps and work is now going on to combine these with the interferometric mosaics that we already have of the same region.

Work on the next Science Verification data release continued. Here are some results from the Band 6 data set showing the multiple protostar IRAS 16293. Notice the narrow absorption features seen in the northern source. We are confident that these are real but they seem to have been missed in previous observations of this object.



Unfortunately the Band 9 data that we have on this object has proved hard to calibrate satisfactorily due to various problems that we were having with the system at the time of the observations. Although the spectra are again rich in lines, we have reluctantly concluded that this data set is not suitable for release, since it would be very difficult for people to carry out a satisfactory reduction for themselves, so we are presently working to provide a Band 9 set on another object (IRAS 16293 is badly placed for observing at the moment) to go out in this release.

Work continued on a range of technical problems, including the measurements of the antenna surfaces and tests of new features such as mixed correlator modes. The major concerns were however in the software area. As explained in the Computing section, one of the problems outline in the October report, the one relating to the control of the phase of the final local oscillator, was successfully resolved, but problems related to the notification channel continued to affect us throughout November. These problems, which relate to the communications between software components, are present in R8.0.3 as well as R8.1 and appear to cause a wide range of errors to be reported. In most cases a full system restart is needed to recover. This has had a significant impact on both CSV and ES observing this month. In addition a problem was found concerning the way in which the failure of an antenna to reach the source in time was handled in R8.1. This caused long delays between scans whenever it occurred and prevented us from adopting the new release for Early Science. The solution proved quite complicated but it is now in place, so we are now poised to make the transition to R8.1. We have been anxious to do this because R8.1 contains an improved front-end tuning algorithm as well as the proper handling of the LO phase for high resolution observations.

The problems with the network connections between Santiago and the OSF and with replication of the archive between these locations have also had a damaging effect on both CSV and SciOps work. We are trying to get to a situation where we can carry out our day to day work without being dependent on that link, but this has not yet been achieved and it will require some restructuring because of the way in which access to the science projects is arranged.

As usual Science IPT staff from the executives continued to play a key role in the pre-acceptance testing of the antennas and preparations for the acceptance reviews.

9.3 Staffing

We had visits from Ciriaco Goddi and Anaelle Maury plus, later in the month, Oja Panic (all from the EU ARC) and Erik Muller and Takeshi Nakazato (from the EA ARC) assisted us in the single-dish campaign. There were also several NA ARC visitors to Chile who were mainly working with the Science Operations team on aspects of data reduction.

9.4 Outreach

There rate of visits from media groups has continued to be high although it may be that the peak has passed for the moment. This is giving many of the scientists valuable experience of interacting with the media and we hope that our efforts are giving a positive impression of the project to the public.