Subject: My notes from the meeting.
Date: Mon, 1 Mar 1999 10:47:52 -0500 (EST)
From: Al Wootten <awootten@NRAO.EDU>
To: rbrown@polaris.cv.nrao.edu

Summary of Conversations between Europeans and Americans on Science and Systems

The number of antennas should target 7000 square meters, or 64 12m diameter antennas. The antennas should be deployed in configurations ranging from a compact array, closely spaced (15-16m) to a large array encompassing 10 to perhaps 20 km diameter. Investiagtion of the optimum pattern for the array will be iterated by US and European groups; the process of identification of specific sites will begin in March when several sites will be visited and staked.

If the acceleration rate specification can be met at reasonable cost, nutating secondaries may not be necessary in the production run of antennas. Holdaway has modeled the noise in total power maps made with an antenna in an unpublished memo. Some tests of this theory will be undertaken by the Cambridge UK group on the JCMT. Currently, specifications on 'On the Fly Mapping' (OTF) along with fast switching, set the acceleration constraints on the antenna, since OTF must be executed sufficiently rapidly to cancel atmospheric variations. The noise achievable in OTF maps should match interferometric noise and not be limited by atmospheric contributions. Neither should receiver noise ('1/f noise') be the limiting factor on image noise. Rough specifications for this are in the project book.

There was some discussion about the science drivers for the 33-45 GHz band. Specifications for this band were developed when the array was planned as 40 x 8m antennas. A committee of proponents of Qband science should re-examine the specifications in light of the planned 64 x 12m antennas--suggested membership Owen, Carlstrom, Uson, Hills.

Care should be taken that overly wide specification in receiver bandwidth does not compromise receiver sensitivity.

The second 183 GHz receiver built by OSO should arrive at Chajnantor in March. The UK (Cambridge) will lead the effort to examine the data from the dual 183 GHz receivers and contrast that data with the 12 GHz interferometer data, and radiosonde data. A goal of these studies, in confunction with similar studies at 22 GHz at OVRO, BIMA, IRAM and the VLA, is to define the algorithmic form by which the data is corrected and to determine a propitious number and spacing of sampling channels, whether a second generation receiver might be cooled, the effects of non-cospatiality of the beams, and receiver design. A further goal is to develop estimates of the ultimate accuracy of phase corrections made using water vapor radiometers.

Polarization of all receivers is to be linear, with a capability to insert e.g. quarter wave plates to provide circular polarization in certain frequency bands. These bands should be selected with regard to continuum sensitivity and availability of molecular transitions suitable for Zeeman experiments.

Receiver bands for evaluation receivers should be as described in the project book. If antennas are moved to the site sooner than projecte in the WBS a 650 GHz receiver should be provided.

Receiver tuning should be possible durint the time scale to move from calibrator to source in a fast switching mode. Simultaneous dual frequency operation is not necessary. Provision should be made such that some operation at 200 microns might be done at a future date.

Over the top telescope operation -- 90 - 130 degree elevation -- offers some advantages for calibration but isn't a scientific imperative. At the highest frequencies, there may be some advantage as one wants to maximize observing time at high elevations.

The promise of the telescope and the site is such that operation at Chajnantor should be a goal to be realized as soon as pracitcal.

A specification for maximum sustained data rate has not yet been set by the science group. System reliability should be considered in design with care to provide maximum sensitivity.

A smaller leaner advisory committee consisting of perhaps six European and six American members should evolve into a replacement for the MAC and SAC. Monthly phone meetings and yearly face to face meetings should occur. Special committees to examine particular issues might be empanelled. There should be a single combined Memo Series and WWW site with mirrors on both sides of the Atlantic.