

From athompso@polaris.cv.nrao.edu Tue Jan 31 15:08:35 1995  
From: athompso@polaris.cv.nrao.edu (Dick Thompson)  
Subject: Material for Meeting.  
To: dbagri@zia.AOC.NRAO.EDU (Durgadas Bagri), bclark@polaris.cv.nrao.edu,  
ldaddari@polaris.cv.nrao.edu (L. R. D'addario),  
rescoffi@polaris.cv.nrao.edu, jromney@polaris.cv.nrao.edu,  
spadin@caltech.edu (Steve Padin), rsramek@polaris.cv.nrao.edu,  
thornton@bkyast.berkeley.edu (Doug Thornton),  
welch@bkyast.berkeley.edu (W. J. Welch),  
jc@phobos.caltech.edu (John Carlstrom)  
Date: Tue, 31 Jan 95 17:08:23 EST  
Cc: athompso@polaris.cv.nrao.edu (Dick Thompson)  
X-Mailer: ELM [version 2.3 PL11]  
Content-Length: 2876

To: MMA System WG: the following material will be useful at our meeting on Thursday (Feb. 2) Dick

Conclusions and Questions from the MMA Advisory Committee.

The following notes are taken from e-mail messages circulated by Bob Brown on 9/24/93 and 12/15/94, to summarize conclusions of the MMA Advisory Committee.

MMA Advisory Committee meeting of Sept. 1993

Good phase calibration is essential for MMA operation in the longest configurations. Two techniques seem especially promising, monitoring Tsys variations and direct measurement of the 22 GHz water line profile, both of which need detailed study. Much of this can be done through the MMA Joint Development Group (JDG).

The optical layout needs to be simplified. Suggestions include designing with faster optics, eliminating the simultaneous dual frequency option, and eliminating any plans to terminate the image sideband in a cold load.

Access to both sidebands is essential. The design should include a way to separate the sidebands at the front-end, either quasi-optically or with sideband separating mixers. The latter is another area where JDG cooperation could be given further emphasis.

MMA planning should include plans for a very wideband continuum system, perhaps involving an analog correlator or a contiguous set of wide digital correlators.

Gain compression of the SIS mixer receivers in solar observations should be prevented by using attenuators in the optical path, not by increasing the number of junctions in series at every frequency.

Direct on-site phase stability measurements should be made to complement the tipper stability measurements. The possibility of including a long, 3 km, baseline in the phase stability measurements should be investigated.

Careful attention needs to be paid to the cost premium for full

single dish capability on all the array antennas.

MMA Advisory Committee meeting of Nov. 1994

(Only points relevant to system design are included below.)

How strong is the scientific case for capabilities that are driving the design in difficult directions? Issues identified are as follows:

- a. The rationale for solar observations.
- b. Low frequency (less than 70 GHz) observations.
- c. High frequency (greater than 400 GHz) observations.
- d. Resolution times bandwidth for the correlator (how many channels needed at highest bandwidths?).
- e. Need for baselines greater than 1 km.
- f. Southern hemisphere versus northern hemisphere science.
- g. Large mosaics with many pixels.
- h. Polarization

Most people agreed with the proposition that the bread and butter of the MMA will be at frequencies from 200-370 GHz.

Someone noted that we should be aware that things we can't imagine doing now (e.g., large mosaics) may still be useful capabilities, even though most did not believe that such capabilities should be major drivers at this point.