

Subject: Re: LMA instrumentation

Date: Thu, 28 Jan 1999 12:07:28 -0500

From: Anthony Kerr <akerr@nrao.edu>

Organization: NRAO

To: stafford@mrao.cam.ac.uk

BCC: akerr@nrao.edu

DRAFT

Dear Stafford,

Good to hear from you.

I am very pleased you would like to collaborate with us on receiver development for the MMA/LSA. Pan and I enjoyed our work with you during your visit in 1991 and would welcome further collaboration. We have had several similar enquiries from overseas, but must wait to make any plans until after the high level MMA/LSA administrative meeting next month, at which division of work between MMA and LSA participants will be discussed.

Your interest in making sideband separating mixers at high frequencies is very relevant. We don't yet know how far our Nb MMIC approach can be pushed up in frequency before (as you say) losses become too high. Pan is now working on a mixer for 650 GHz to try and answer this and other questions.

You mentioned planar mixers -- presumably you mean quasi-optical mixers, not in waveguide. My feeling is that waveguide mixers with feed horns will result in better overall receiver performance even up to 960 GHz. If corrugated horns are too expensive, your diagonal horns may be the ideal solution. Do you agree with this, or should we consider QO mixers for the highest frequencies? The biggest challenge may be the thin substrates for w/g mixers -- not a problem with some quasi-optical designs.

I believe LO sources may well be the toughest part of the MMA receiver development. You probably know that we have Richard Bradley et al. working with UVA on multipliers, and we also have a contract with UCLA to develop photomixer LO's. The photomixer is a very appealing approach, but there is some doubt whether it can be done in time for the MMA.

One of our biggest concerns is not so much doing the receiver development for the different frequency bands as the production of > 100 of everything with acceptable performance. At the Pasadena THz Symposium last year I organized an impromptu meeting for everyone interested in the MMA/LSA which was attended by many of the Europeans (perhaps you were recovering from a back injury and missed that meeting). Everyone was interested in doing the development work, but no one was interested in producing 100 of what they developed! I think people who are funded to develop components must also be responsible for production and testing.

> I will be coming over to Charlottesville for the STT conference,
> and we could get together for an hour to talk about LMA related work if
> you feel that anything useful could come out of it.

Yes, I think that would be most useful. Possibly the day before or after the symposium would be best.

I look forward to seeing you in March.

Best regards,

--Tony.