First joint PDR: LO system in Tucson

Formal panel: Fetterman, Weinreb, Pearson, Emerson, Webber, Sramek, Payne

Radford: science requirements

tuning resolution: 1/16 of 1st IF BW = 500MHz, scaled with frequency —
Larry says this is ambiguous — he had 2 GHz
at the front end, 250MHz at the back end
contentious — Larry argumentative
driver is getting wide lines within one 2GHz band

Darrel: time to switch within one rcvr band: 10 msec front end (rules out mechanicals)
freq. switch, band switch: TBD
went through details of phase noise, power etc.

Larry: baseline LO
test interferometer

Payne: photodetector outline

Shillue: photodetector details + laser locking
Pearson: dynamic range requirement? (line broadening — need
50 dB 100kHz away? I don't quite understand this.)
Optical comb generator must be developed — they exist
but not as commercial devices.
Round-trip phase correction: fiber-ring lasers BW a few kHz free-run
Goal to measure at 110 GHz w/25km fiber on a spool
UCLA ~4μW w/wafer probe @ 80–95 GHz

— LUNCH —

Emerson & Vaccari: photonic phase cal
Model shows about −96 dBm at 1 THz — would be ~10 dB
more than what is required

Thacker Bryerton, Webber: LO multiplier & source status

Pazpar: Rolf Güsten's slides - meeting report

Drop LO power requirement to 30μW?

Ellison: UK interests in photonics & multipliers

RAL HBVs: intrinsic odd harmonics only

use back-etching for re-entrant probe structure

e.g. 8% efficiency at 15K over 250-300GHz output range w/horns

SU8 and silicon micromachining for blocks (hundreds on a wafer)

(don't cool well - they explode!)

starting collaboration with NTT for photomixers

General discussion:

Fetterman: can't continue to do all options in parallel

likes all-photonic but doesn't know if it is viable

specs don't seem to be well defined, esp. power

European expertise should be integrated quickly

consider not doing 650 until later

Pearson: a number of minor technical issues

consider expense - look at overall system

device control for photonics & diodes is minimal - may have underestimated resources required - JPL is spending $1M/yr on devices

may benefit from European collaboration

Ellison: diodes also come from Lisle, Chalmers, Darmstadt

Wemweb: specs are OK

approach - multiply, correct for this phase, on top of things

photonic phase cal - not essential

anything missing? Haven't heard about major procurements

Enough money for UVA? Working on a shoestring?

Some power amp procurement issues.

Weinreb: good cost estimates for development devices?
Try to do baseline system with available parts to the greatest extent possible.
Later years: may get new devices which could make a better system.

D'Addario: Baseline plan doesn't need photonic device development.
No tuners - big constraint
Should we really plan on a decision in June 2000?

Pearson: Planar multipliers reach only to 320 GHz at present.
Erickson's first design for 600 GHz didn't work at all.
Getting input Q low enough for 20% bandwidth is hard.
Lots of multiplier work needed - FIRST needs 22 different designs, has 9 people working, probably won't meet 1½ year deadline.

Executive Session — members only

LO PDR – second day

D'Addario: review of schedule

Weinreb: plan lab interferometer test? Not explicit in schedule.

Fetterman: won't have high-freq photomixers in hand by decision date of June 2000 – can decide right now

Concurrence from Weinreb & Pearson.

What do we need to decide II vs. III? Do we delay? European role?

Weinreb: make photonic phase cal part of baseline plan, delay decision until you see whether this has enough power. Need a year of lab work after a first 650 GHz device appears. Wait until 2003 to make final decision.

Fetterman: lots of U.S. resources – use them.

Sramek: need to look at entire system – can't make II/III decision all by itself.

Wild: just do what is needed – SIS mixer doesn't care how its LO is generated.

Executive Session

Send Emerson comments for incorporation into report

Real power requirements?