NRC · CNRC

Expanded Very Large Array

EVLA Prototype Correlator (PTC)

P. Dewdney

Herzberg Institute of Astrophysics

National Research Council Canada

Corrélateur WIDAR Correlator

On-the-Sky Testing

- Primary purpose – DRAO led (Critical OTS Tests).
  - Verify Hardware so that production phase can proceed.
  - Check for HST-style bloopers.
- Secondary Purpose – NRAO led.
  - Integration of a “small” system with EVLA software.
  - Testing of such, and further checks of software through-put.
- Tertiary Purpose – NRAO led.
  - Test wide-band observing.
  - Develop wide-band calibration techniques.
- Quaternary Purpose – NRAO led.
  - Look at wide-band RFI environment.
  - Develop evasion/expurgation measures.
- Quinary Purpose – NRAO led.
  - Carry out early observations where possible.

Correlator System Testing Summary

- Stage 1/2: Prototyping and testing.
- Stage 3 Prototype testing
  - 16SB/16BB in racks will form “testable unit sub-systems”, loaded in a way that is very similar to final rack configuration.
  - Subjected to as many tests as possible in lab environment.
  - When complete, the OTS system will be shipped to Socorro.
- On-the-Sky (OTS) – 10-antenna.
  - Principal DRAO purpose is to verify hardware in-system.
  - Check for HST-style bloopers.
  - Long integration times available.
    - Already done for correlator chips.
    - Could be done in the lab, in principle.
- Production Testing
  - Both correlator chips and finished circuit boards will be subjected to temperature cycling and subsequent testing/burn-in before leaving DRAO.
  - Methodology is worked out, but precise details are not.
  - Testing hardware and equipment has been purchased or developed.

Critical OTS Tests

- Nature of decision
  - ***Is the fault that you just detected possibly attributable to the H/W and not FW or SW?***
  - Most testing will have been done in Penticton.
  - Most bugs will not be the correlator.
  - But … if there is a correlator bug, it will be exist forever.
  - Answer is real-time monitoring of the OTS tests.
- Michael/Brent's list (4 months?)
  - Basic setup/connectivity checks
  - Delay tracking
  - Noise switching
  - First fringes
  - Strong source, known flux density (check corr'n coeff)
  - Deep integration on mostly blank field (corr offsets and other systematics)
  - Deep spectral line integration (bandpass stability)
  - Recirculation on narrow line(s)
  - Sub-band stitching (comes "for free")

NRC · CNRC

Major Question

- Should we skip Critical OTS testing?
- If we “overkill” the OTS testing before production is triggered, does that slow down science operations?
  - i.e. How much does the correlator hardware production schedule affect the overall EVLA schedule?

End