Science Commissioning

EVLA Advisory Committee Meeting, March 19-20, 2009

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Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array
Robert C. Byrd Green Bank Telescope
Very Long Baseline Array

NRAO

Objective

- Describe planning and status of EVLA systems and science commissioning

Systems Commissioning

- The design, development, and execution of tests and measurements that verify the EVLA antennas, receivers, electronics, correlator, and software perform to project specifications.
- Has been ongoing since EVLA antenna conversion began
- Results reported in systems performance talk by Perley
  - Also see correlator talks by Rupen

Science Commissioning

- The development of procedures needed to:
  - initiate, carry out and complete observations
  - aid the analysis of EVLA astronomical data
- Has become increasingly important as subsystems have been tested and delivered, and EVLA has reached the critical mass of a full instrument
- Currently focused on supporting upcoming shared risk observing program (described below)
- Science commissioning tasks needed to support deliverables through 2012 have been identified, and staff assignments to complete the tasks have been made

Early Science: Shared Risk Observing

- A program that continues to make the EVLA available to the community via *peer-reviewed* access while it transitions from a construction project to a fully-operational telescope.
  - Program takes place in 2010-2012.
- Open Shared Risk Observing (OSRO)
  - Uses WIDAR to provide significant improvements over VLA
  - Only modest bandwidth supported initially [sees talks by Dickman, Chandler, and Rupen for details]
- Resident Shared Risk Observing (RSRO)
  - Provides full access to WIDAR in return for a period of residency to help with Science Commissioning.
  - Primary objective is to develop wide bandwidth capability of WIDAR in a staged process [see talks by Chandler and Rupen]

Science Commissioning Tasks for OSRO

- To be completed prior to start of OSRO in Q1 2010.
- Examples:
  - CASA spectral line and cube analysis
  - Delay calibration procedure for WIDAR
  - Prototype on line helpdesk
  - Bandpass stability tests with WIDAR
  - System temperature calibration
  - Gain curve determination
  - Accurate gain calibration
  - Develop new wideband calibrator models
  - Conduct calibrator survey

Science Commissioning Tasks for RSRO

- To be completed during OSRO period in 2010-2012
- Examples:
  - Wideband, narrow-field imaging of single, unconfused sources
  - Gain calibration for wide bandwidths, weak calibration sources
  - Automatic editing of uv data
  - Narrow-field imaging of single sources with confusing sources
  - Improve reference pointing
  - Polarization calibration: time & frequency dependence