

Scientific commissioning

- “Standard” observing for OSRO 2009 Q3—2010 Q1
- How to *observe* with wide bandwidths:
 - Test OPT (L/C/K/Ka/Q, VLA-X) 2009 Q4
 - Observing methodology:
 - Low-frequency (L/S/C) 2009 Q4
 - Mid-frequency (X/Ku) 2010 Q3—2011 Q2
 - High-frequency (K/Ka/Q) 2010 Q1—2010 Q4
 - Requires reference pointing (telcal) 2010 Q1
 - Calibrator survey 2010 Q2
 - Stability
 - L/C/K/Ka/Q, complex gain & bandpass 2009 Q4—2010 Q1
 - S/X/Ku, complex gain & bandpass 2010 Q4—2011 Q1
 - L/C/K/Ka/Q polarization 2010 Q2—2010 Q3
 - S/X/Ku polarization 2010 Q4—2011 Q1
 - Service calibration for flux, polarization leakage
 - L/C/K/Ka/Q 2010 Q4—2011 Q1
 - S/X/Ku 2011 Q4—2012 Q1

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- How to *observe* with wide bandwidths:
 - Special calibration for full-field polarization 2010 Q3
 - VLBI mode set-up (SCHED/OPT) 2010 Q2—2010 Q3
 - Pulsar observing set-up with OPT 2010 Q3
 - Mosaicing
 - Multiple single pointings (not OTF) 2010 Q4
 - OTF mosaicing set-up using OPT 2011 Q3
 - Solar observing set-up with OPT 2011 Q1
 - Observing recommendations documented on the web
 - L/C/K/Ka/Q 2010 Q1—2011 Q2
 - S/X/Ku 2011 Q1—2012 Q2
 - Incorporate into observing procedures in OPT 2012 Q4

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- Scheduling heuristics
 - Mid-frequency 2010 Q2
 - Low-frequency (solar activity, ionosphere, RFI) 2010 Q3
 - High-frequency (weather) 2010 Q3
 - Coordinated observations 2010 Q4
 - Parallax requirements 2011 Q1
 - Stellar binary phase 2011 Q1
- How to *flag* data:
 - Low-frequency (RFI)
 - RFI excision 2010 Q2—2012
 - High-frequency
 - Poor tropospheric phase stability 2010 Q3—2011 Q2
 - Mid-frequency 2010 Q4—2012
 - Algorithm development and testing 2010 Q2—2012
 - Recommendations documented 2010 Q2—2012

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- External calibrations
 - Delays/fringe fitting
 - L/C/K/Ka/Q 2010 Q2
 - S/X/Ku 2011 Q1
 - Complex gains
 - Low-frequency 2010 Q3
 - High-frequency
 - Weak calibrator sources 2010 Q3
 - Mid-frequency 2011 Q1
 - Flux calibrator models
 - L/C/K/Ka/Q 2010 Q2—2012
 - S/X/Ku 2011 Q1—2012
 - Pipeline heuristics
 - L/C/K/Ka/Q 2011 Q1
 - S/X/Ku 2011 Q3
 - Recommendations documented, incorporated into pipeline
 - L/C/K/Ka/Q 2011 Q1
 - S/X/Ku 2011 Q3

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- Special calibration issues
 - VLBI calibration transfer 2010 Q3
 - Pulsars 2011 Q2
 - Solar 2011 Q2
- Self-calibration
 - Pointing 2011 Q1
 - Instrumental polarization calibration 2011 Q1
 - Full-field amplitude and phase 2011 Q3

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- Correlator/observing modes (in priority order)
 - Identical sub-bands 2010 Q1
 - Trading sub-bands for channels 2010 Q2
 - Recirculation 2010 Q3
 - Independently tunable sub-bands 2010 Q4
 - General correlator resource allocation 2011 Q4
 - Planetary 2010 Q1
 - Subarrays 2010 Q3
 - Phased array for VLBI 2010 Q2
 - Phased array for pulsars 2010 Q2
 - Single-dish VLBI 2010 Q3
 - Astrometry (requires A config) 2011 Q1
 - Solar (requires solar cal hardware) 2011 Q1
 - Pulsar gating and binning 2011 Q2
 - OTF mosaicing 2011 Q3
 - Burst mode 2011 Q3
 - Radar mode 2011 Q3
 - Correlation of external antennas (PT, LWA, etc.) 2012

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- Correlator/observing modes (cont.)
 - 7-bit correlation 2011 Q4
 - Fast switching between correlator set-ups 2011 Q4
 - Very fast dumps 2011 Q4
 - Mixing of 3-bit and 8-bit samplers 2012
 - More CBE processing 2012
 - Online RFI flagging 2012
 - Multiple phase/delay tracking centers 2012
 - Output to user instruments 2012

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- Imaging
 - Narrow-field imaging of single, unconfused sources 2009 Q1
 - Narrow-field imaging of single sources with confusing sources 2009 Q4
 - Spectral line cubes 2010 Q1
 - Imaging of \sim FWHM of primary beam 2010 Q2
 - Full field polarization imaging 2011 Q1
 - Pulsar “bin cubes” 2011 Q1
 - Deconvolution algorithms 2011 Q1
 - Mosaicing 2011 Q1
 - Combination of EVLA and GBT data for short spacings 2011 Q4
 - High dynamic range imaging 2012 Q1
 - Image plane corrections for ionospheric effects 2012 Q1
- Data analysis
 - RM synthesis imaging 2010 Q2
 - 3D source cataloging 2012 Q1
 - 3D visualization 2012 Q4