

# GBT Data Reduction and Analysis

Bob Garwood



# M&C Produces “raw” FITS files

- Set of files for each scan
  - “Static” files, fixed at start of scan
    - GO
    - IF
    - LO
  - “Dynamic” files, grow as scan progresses
    - Antenna – typically sampled every 0.1 s
    - Backend – the data plus keys that allow you to use the other files appropriately
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# Backends

- Spectral line
  - Spectrometer
  - Spectral Processor
  - Zpectrometer
- Continuum
  - DCR
  - Mustang
- Various pulsar backends



# Real-time monitoring

- GFM – The GBT Fits Monitor
  - Automatically processes routine DCR pointing and focus scans.
  - Can be used to view the raw, unreduced spectral line data from the Spectral Processor and the Spectrometer
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# Data capture

- Anything which does the appropriate steps so that each chunk of data is properly labeled with an antenna pointing direction, frequency, and meta information to describe it.
  - *sdfits* – tool to do that. Primarily used for spectral line backends. Runs while data is being taken so that it is available shortly after the scan finishes. Zpectrometer output requires additional processing before a spectrum is produced.
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# Data Reduction and Analysis

- IDL
  - GBTIDL
    - IDL scripts
    - Modeled on package of Tom Bania
    - Heavily influenced by UniPOPS and aips++ dish plotter
    - Primarily spectral line including raw spectrometer data
    - No imaging capabilities
    - Limited continuum functionality
  - Mustang – Brian Mason's personal work



# Data Reduction and Analysis (cont)

- Aips++
    - Dish
      - Precursor to GBTIDL
      - Has graphical flagging
      - Statistical flagging
      - Can use aips++ imaging tool
    - GBT continuum tools
      - Can be used with DCR data
      - Calibration and imaging
  - Aips
    - Imaging spectral line GBT data
  - OBIT- continuum imaging
  - Pulsar – Scott Ransom's package. Others.
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