

# COMMENTS ON TAC ORGANISATION

C. MAGNEVILLE & R. ANSARI  
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# Tianlai Level 2 (L2) processing

Raw visibility data  
[  $V_{ij}(\nu)$  ]

(L1 output)

(A) RFI cleaning, time  
dependent gain/noise  
monitoring ...

Cleaned / compressed  
visibility data [  $V_{ij}(\nu)$  ]

Cleaned / compressed  
visibility data [  $V_{ij}(\nu)$  ]

(L2-A output)

(B) Calibration on point  
sources

Calibration data (gain, phase)  
Beam,  $T_{\text{sys}}$   
Cleaned / calibrated [  $V_{ij}(\nu)$  ]

Calibration data (gain, phase)  
Beam,  $T_{\text{sys}}$   
Cleaned / calibrated [  $V_{ij}(\nu)$  ]  
Array configuration

(L2-B output)

(C) Map making

3D sky maps  $I(\alpha, \delta, \nu)$   
Synthesized beams  
noise maps ...

(L2 output)

## Level 3 (L3)

Simplified pipeline steps  
(from September 2016  
presentation)

(D) Component separation  
Foreground/signal maps  
and power spectrum ...

# Software

- We can have several independent software modules, performing the different pipeline tasks
- We can have different implementations of a given pipeline step
- The Input & Output for each module (step) should be clearly defined
  - Limit the use of different file formats
- Use HDF-5 for raw visibilities, and FITS for maps, catalogs ...
- Python (or shell scripts) can be used to assemble pipelines, based on a series of modules with identified (and standardized ?) I/O format and convention
- It would be nice to have a standard (maintained) data reader in python, and possibly C++ . Such libraries should be the common basis (library) for the pipeline.
- Setup a central web server, with pages listing the validated software modules, as well as information about the data

# Tianlai Data, external catalogs & maps

- Define the Tianlai data (visibility) directory structures, in addition to the file format definition
- Maintain a central observations description data base, accessible through a web page - might need to develop / setup a tool for this
- We should be able to update / add information to this data base about the data quality, and calibration information
- Gather the necessary external data needed for calibration / simulations such as Haslam, LAB, GSM maps, as well as radio & HI source catalogs (NVSS) - Document it on the central web service
- In addition to the pipeline software modules, we need some simulation modules - Cosmological signals and foreground simulations, instrument simulation (computation of visibilities from known sky ...)