



ATCA Automation

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ASTRONOMY AND SPACE SCIENCE
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Potential for Automation

Automation of ATCA operations may be undertaken, in an effort to reduce ongoing operational costs.

Several options for this automation:

- Train observers automatically
- Help observers during their observations automatically
- Observe automatically

Observer Training

```
caobs
File Edit View Search Terminal Help
-----CAOBS_LINUX V4.0 Thu 20-Nov-2014 12:03-----
J0743-5619      07:43:20.48421    -56:19:32.96147    J2000.0
                ScanType: NORMAL Pointing: GLOBAL    Mode: STANDARD
Freq1: 1922.0 MHz; ChBW : 64.0 MHz
Freq2: 1922.0 MHz; ChBW : 64.0 MHz
scan 39/498      from 13:25:29    to 13:26:49    (UT)    Tsys ON    LO-tr ON
                v507c.sch                                No averaging
cycle   CA01      CA02      CA03      CA04      CA05      CA06
      12    TRACKING TRACKING TRACKING TRACKING TRACKING TRACKING
-----
13:25:26 Scan started
13:25:31 Hold of 0 ms sent to active antennas
13:25:31 SETA : P = 988.0 H2O = 20.9 T = 28.7
-----
                UT 13:26:26.9      **      LST 03:34:25.2
13:20:56 Drive (mins)    0.1    0.1    0.1    0.1    0.1    0.1
13:22:26 Drive (mins)    0.1    0.1    0.1    0.1    0.1    0.1
13:25:26 Drive (mins)    0.1    0.1    0.1    0.1    0.1    0.1
-----
>set genset_off all
>sho status
-----caobs>
```

Observer Training

ATCA is operated by the observer; this is generally thought of as unusual, but useful.

ATCA is a very flexible telescope, and we have a lot of observers come through each year that have small projects. Each of these observers must be trained, or their training may need to be refreshed.

This training is expensive!

Automating Training

Current Model

- Observers trained by the Duty Astronomer during their observations
 - Tricky observations require training by observatory staff (JS, RW)
- Duty astronomers trained by observatory staff

Automatic Model

- Observers trained online before their observations start
 - Training videos and improved documentation
 - Project friends
 - Online tutorials

Observer Assistance

```
assistance
File Edit View Search Terminal Help
-----CA on-line ASSISTANCE v3.0 Thu 20-Nov-2014 10:24:07-----
Name: 0454-463          End: 1 m          UT : 16:27:54.0    Ep: J2000.0
RA  : 04:55:50.77      Az.: 222.8        LST: 06:32:25.6   F1: 2180.0 MHz
Dec : -46:15:58.7      El.: 65.4         HA : 01:36:34.8   F2: 2180.0 MHz
-----Summary-----
1)Correlator xy phase offset active
2)The xy and yx ampl. on some baseline(s) are larger than 30% of i for F2
-----Error Display-----CA01-----CA02-----CA03-----CA04-----CA05-----CA06-----
Amp. of XY & YX F2:12+ 13+ 14+ 15- 16+ 23+ 24+ 25+ 26+ 34+ 35+ 36+ 45- 46+ 56+
Legend : +=ok, -=not ok, *=disabled, ". "=value ok, <value>=value not ok
Commands:?,1-5,D/EN bell/CA0n/log,H,I,R,S,V,Q      Help OFF, Bell ON , Log OFF
> 
```

Observer Assistance

A normal ATCA observer and Duty Astronomer combination will rarely be experienced enough to have seen all possible problems.

While observing, it is important to be aware of problems so that the time on the array is not wasted. It is important for both the observer and ATNF that you get science from your data.

Again, training an observer and DA to recognise the signs of bad data is expensive!

Automating Assistance

Current Model

- We have the assistance program and MoniCA, both of which are packed with information, but require you to be “eyeballs attached”.
 - Neither will show up subtle problems without extensive training.

Automatic Model

- Improve diagnostic software to catch more subtle problems.
- Make assistance actively contact the observer so alert is seen as soon as possible.
- Improve documentation on how to fix problems without involving operations staff.

Automated Observing



Observer Automation

Training is expensive. Getting good quality data is imperative.

Using an operator and moving to queue mode or dynamic scheduling may save money, if we combine ATCA and ASKAP operators.

Automating Observing

Questions

- Should we?
- Queue mode or dynamic scheduling?
- Do we deliver raw or calibrated data?
- How would we transition?
- How do we keep astronomers informed about telescope capabilities and how to deal with the data?

Thank you

Astronomy and Space Science

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