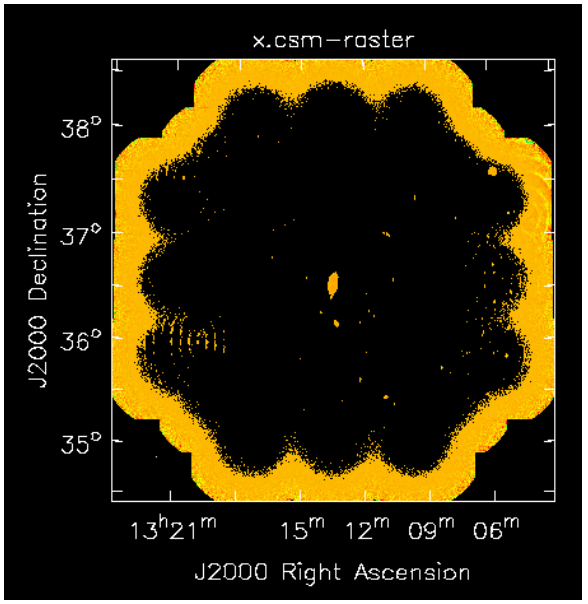
Peter Teuben

ADMIT: automatically detecting HI in large data cubes



"The HI/Story of the Nearby Universe" (Groningen/Dwingeloo 11 Sep 2018)

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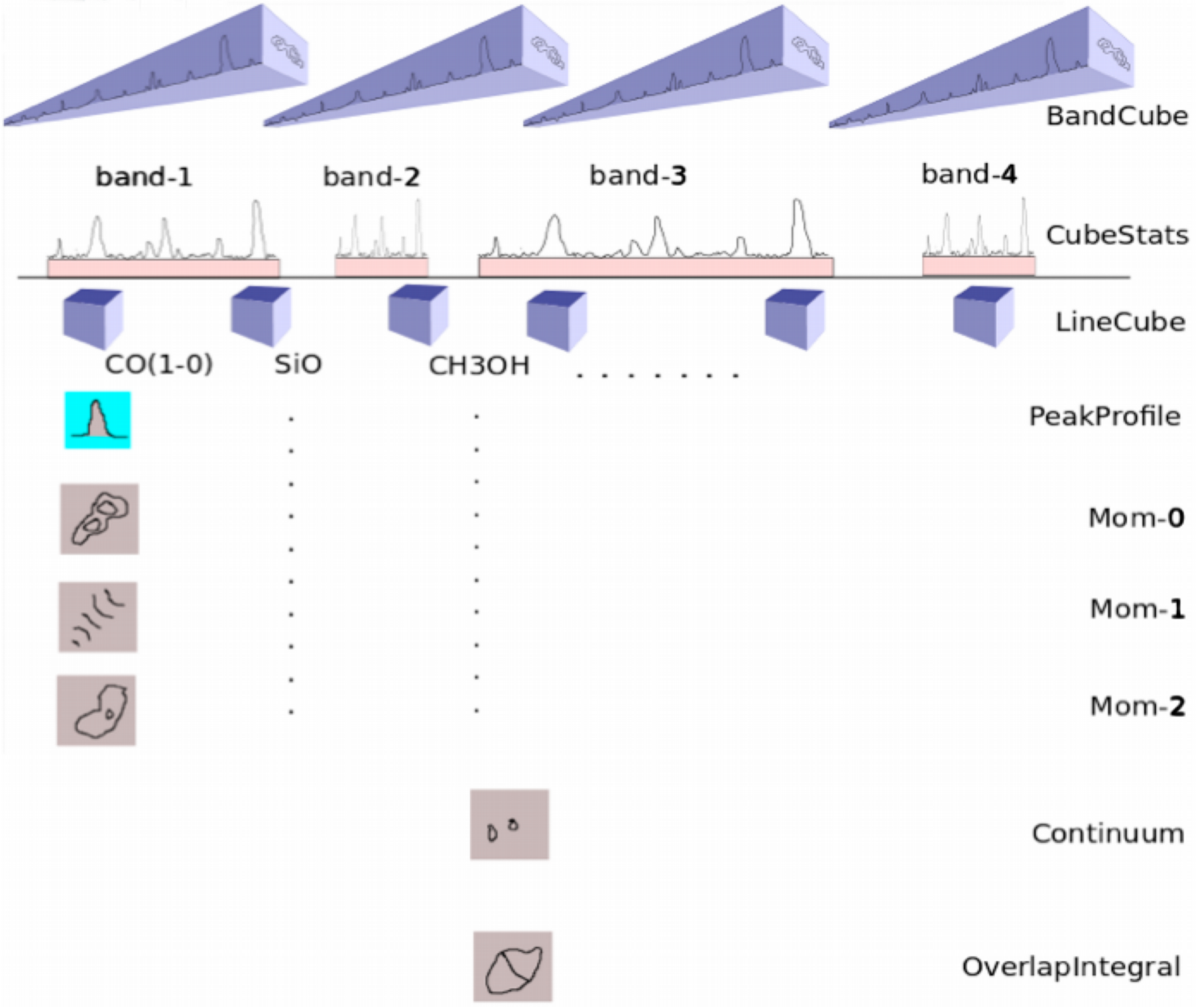
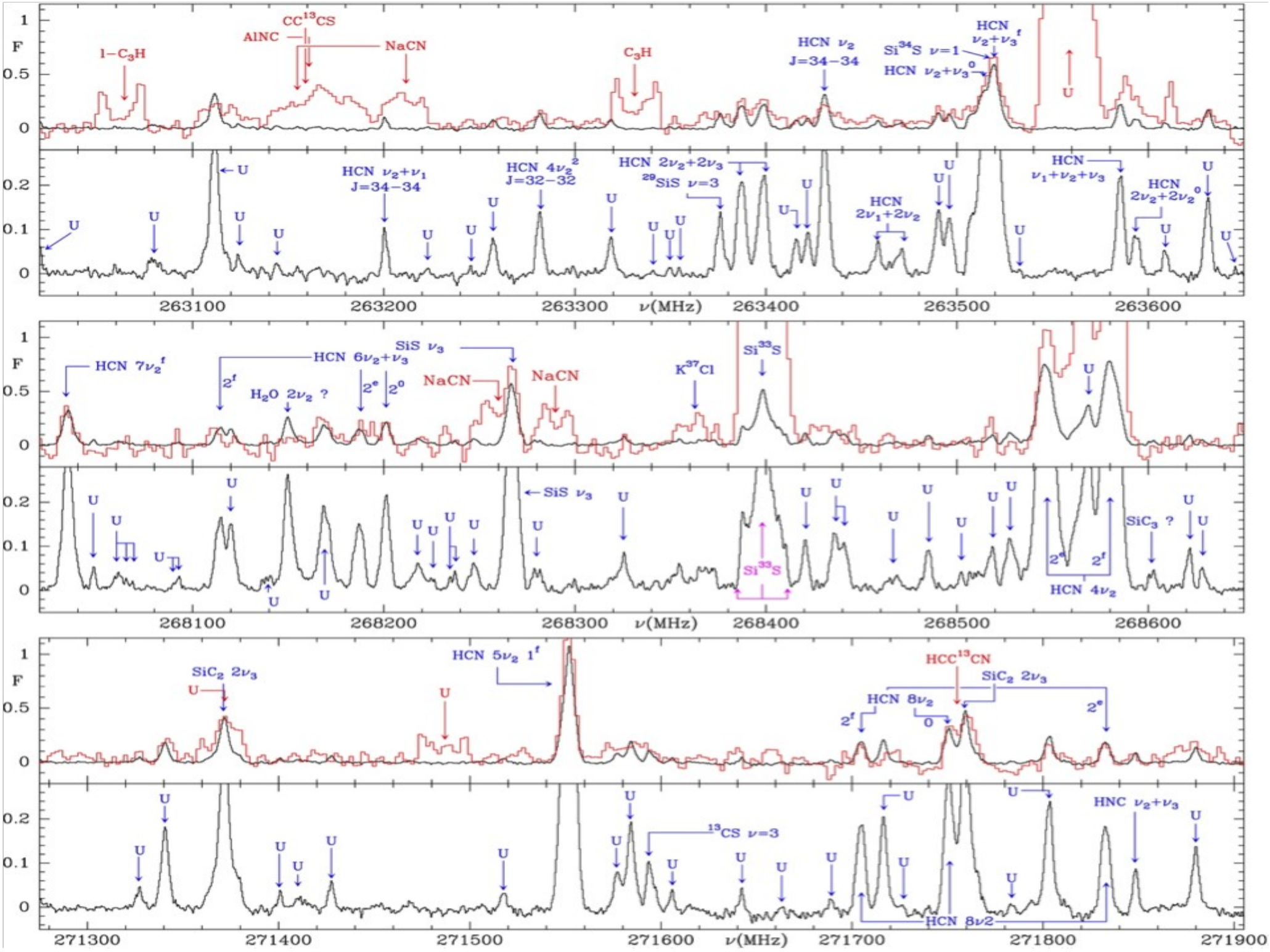
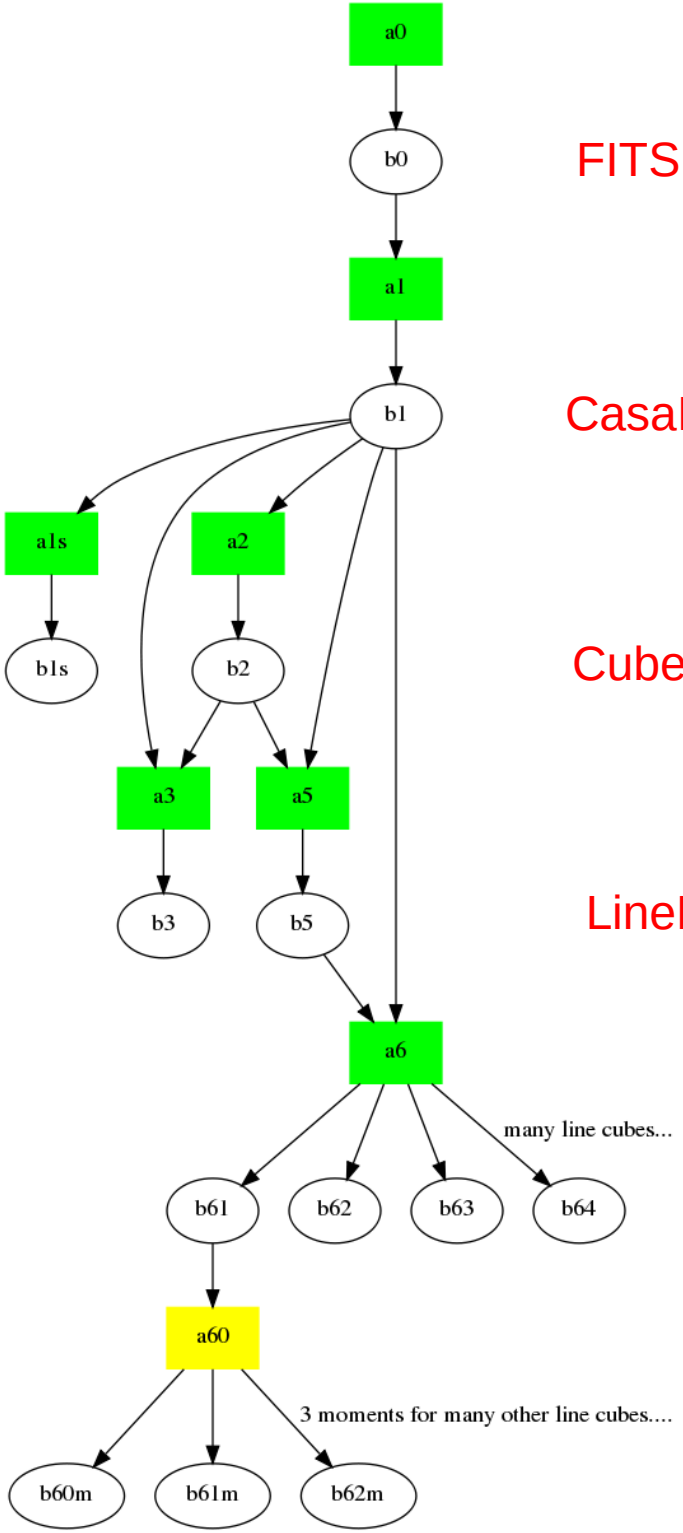
- **ADASS**
  - 2018 in Maryland: Nov 11-15 (deadline Oct 8)
  - 2019 in Groningen: Oct 6-10

ADASS XXVIII
COLLEGE PARK, MD USA


BandCube
band-1
band-2
band-3
band-4
CubeStats
LineCube
CO(1-0)
SiO
CH3OH
. . . . . .
PeakProfile
Mom-0
Mom-1
Mom-2
Continuum
OverlapIntegral


F
1-C3H
CC13CS
AlNC
NaCN
C3H
HCN ν2 J=34-34
Si34S ν=1
HCN ν2+ν3 0
HCN ν2+ν3 f
U
HCN ν2+ν1 J=34-34
HCN 4ν2 2 J=32-32
HCN 2ν2+2ν3
29SiS ν=3
HCN 2ν1+2ν2
HCN ν1+ν2+ν3
HCN 2ν2+2ν2 0
263100
263200
263300
ν(MHz)
263400
263500
263600
HCN 7ν2 f
HCN 6ν2+ν3
SiS ν3
2f
H2O 2ν2 ?
2e
2o
NaCN
NaCN
K37Cl
Si33S
SiS ν3
Si33S
SiC3 ?
HCN 4ν2
268100
268200
268300
ν(MHz)
268400
268500
268600
SiC2 2ν3
HCN 5ν2 1f
HCC13CN
SiC2 2ν3
HCN 8ν2
2f
0
2e
13CS ν=3
HNC ν2+ν3
HCN 8ν2
271300
271400
271500
271600
ν(MHz)
271700
271800
271900



FITS

CasaImage

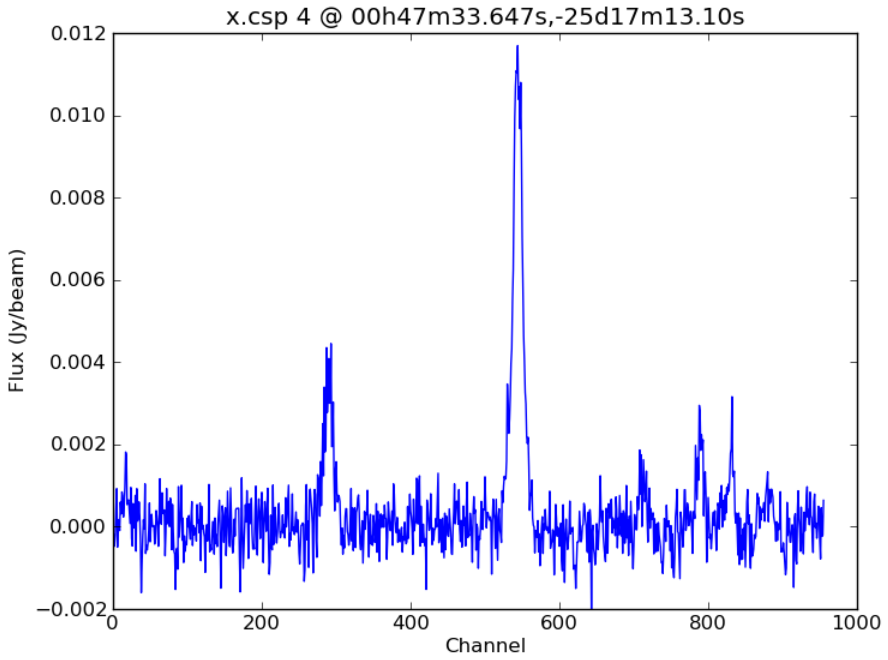
CubeStats

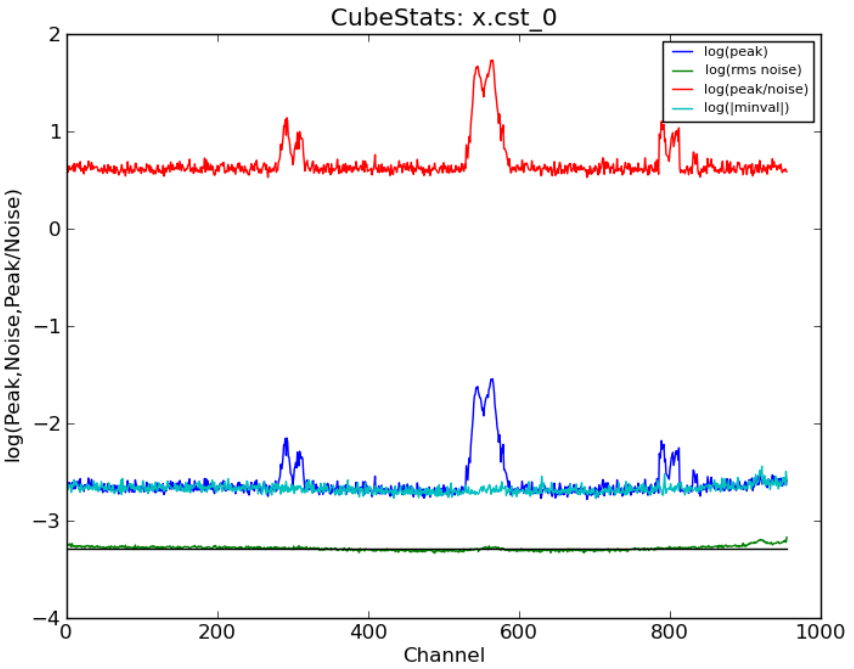
LineList

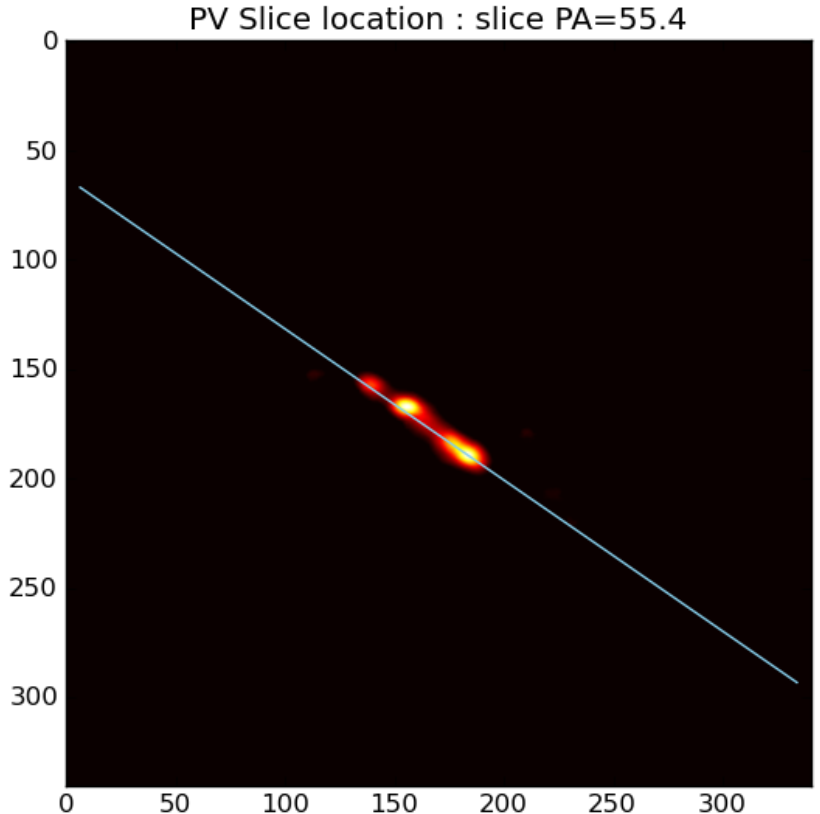
LineCube

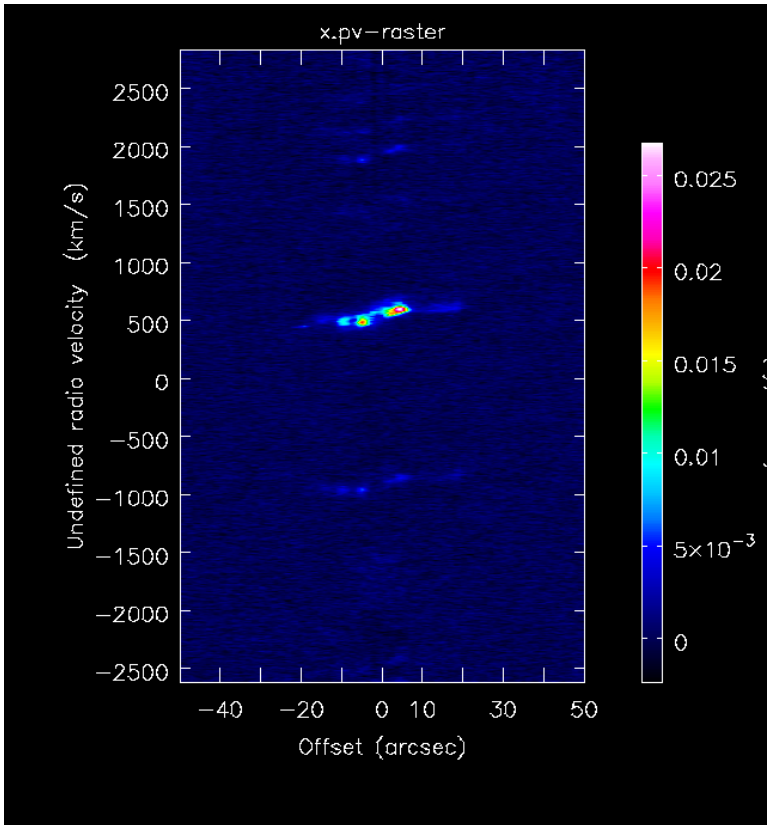
LineCubeMoment0,...

ADMIT flow diagram AT and BDP's

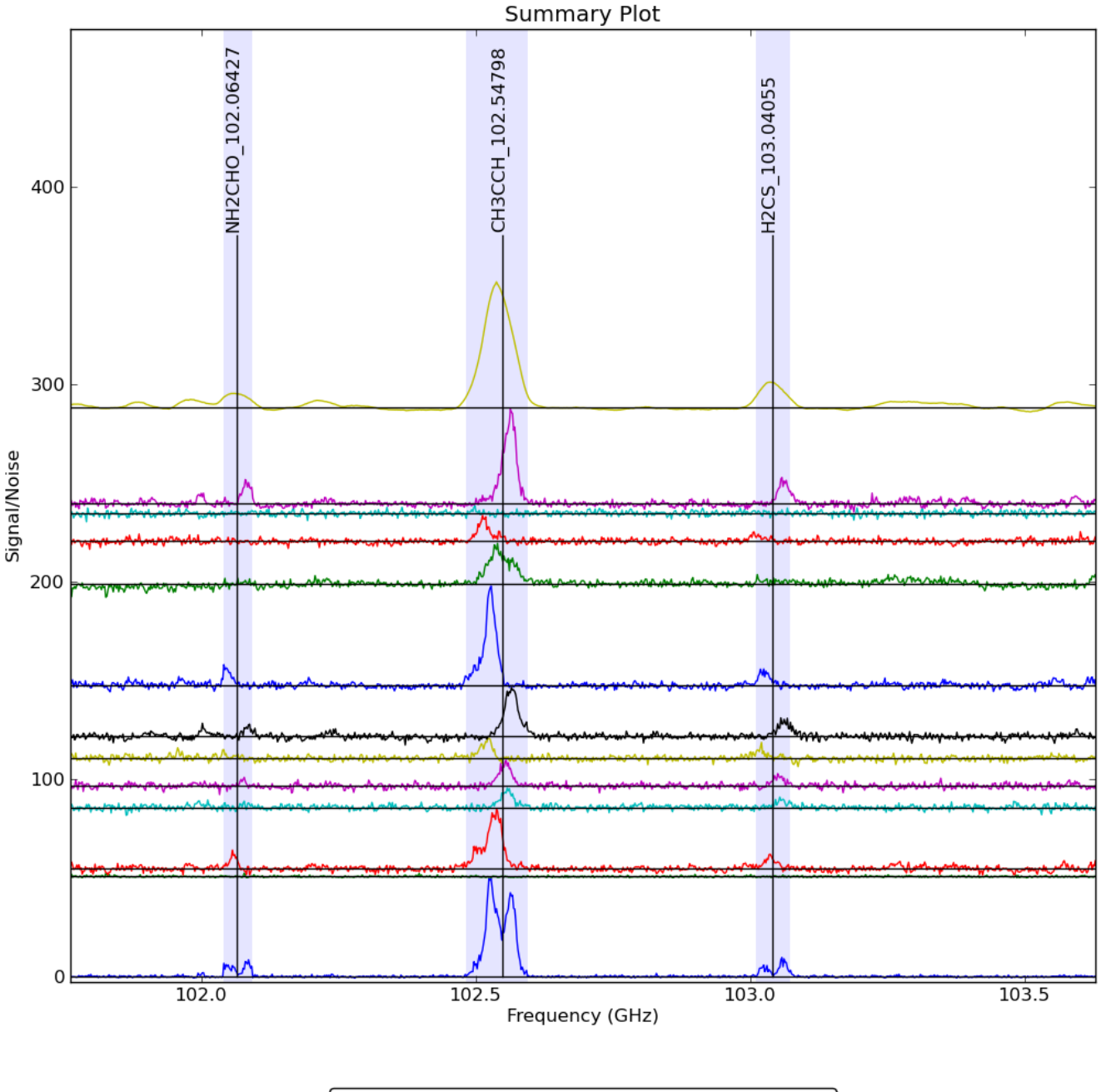

x.csp 4 @ 00h47m33.647s,-25d17m13.10s
Flux (Jy/beam)
Channel
0.012
0.010
0.008
0.006
0.004
0.002
0.000
−0.002
0
200
400
600
800
1000

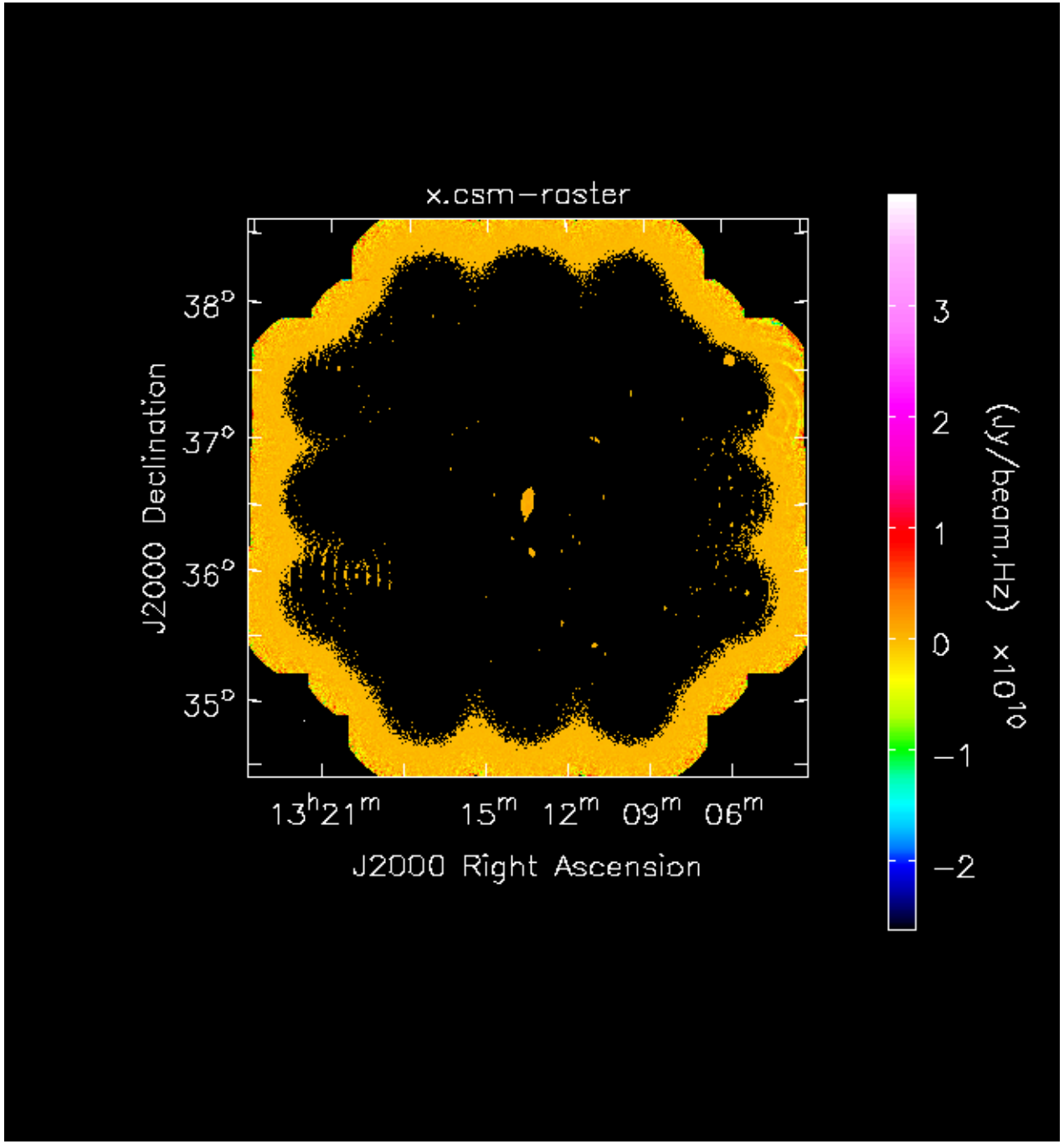

CubeStats: x.cst_0
log(Peak,Noise,Peak/Noise)
Channel
log(peak)
log(rms noise)
log(peak/noise)
log(|minval|)
2
1
0
−1
−2
−3
−4
0
200
400
600
800
1000

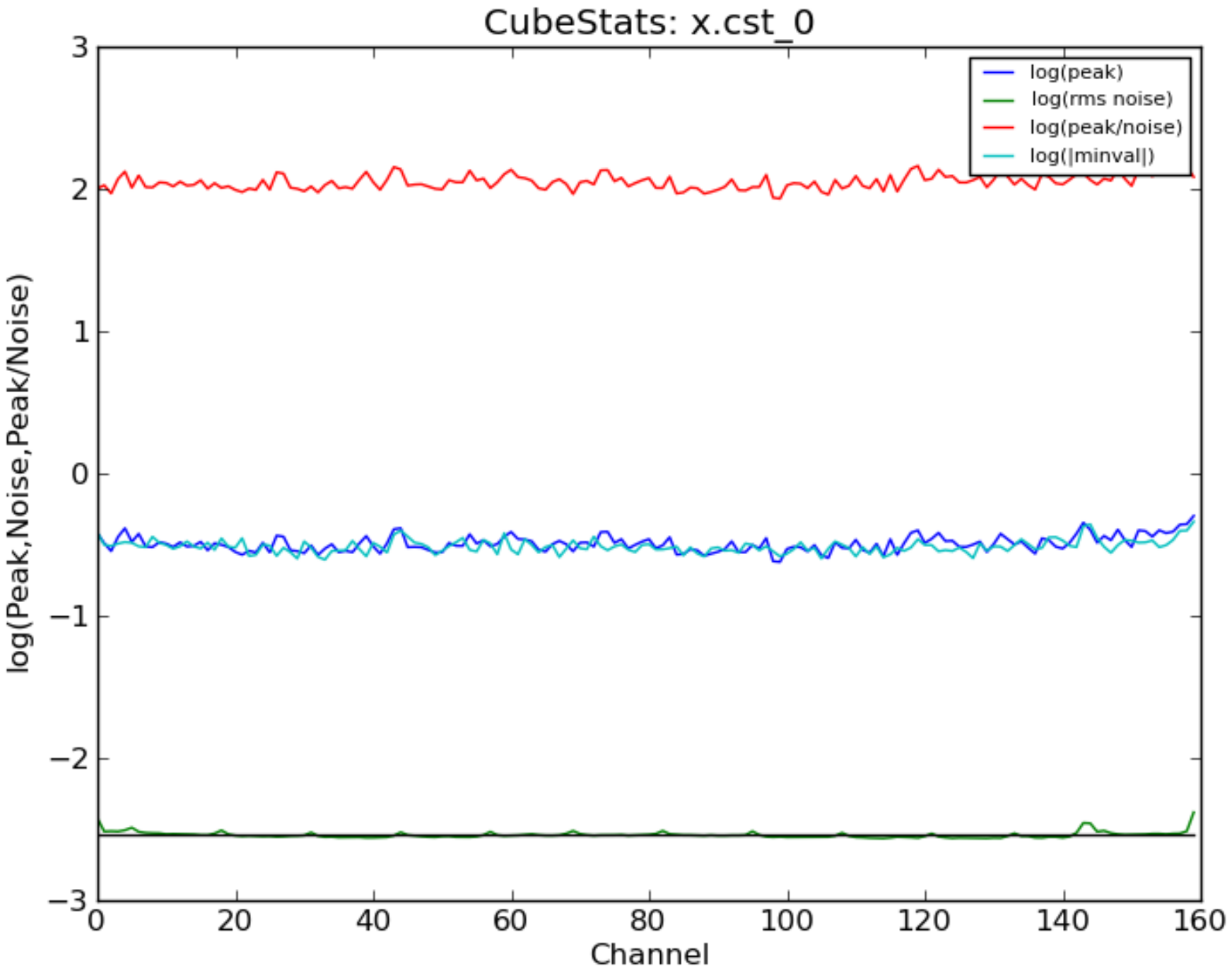

PV Slice location : slice PA=55.4
0
50
100
150
200
250
300

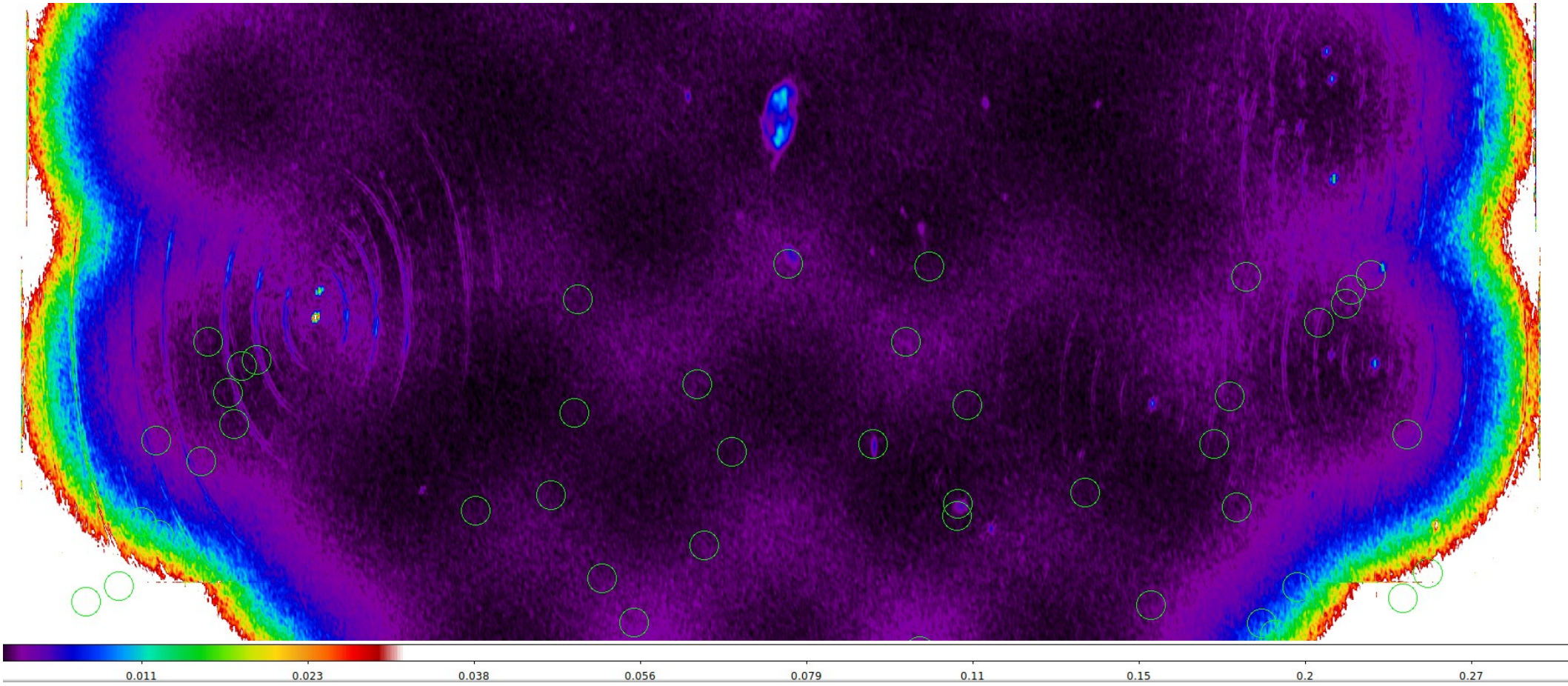

x.pv−raster
Undefined radio velocity (km/s)
Offset (arcsec)
2500
2000
1500
1000
500
0
−500
−1000
−1500
−2000
−2500
−40
−20
0
10
30
50
0.025
0.02
0.015
0.01
5×10−3
0

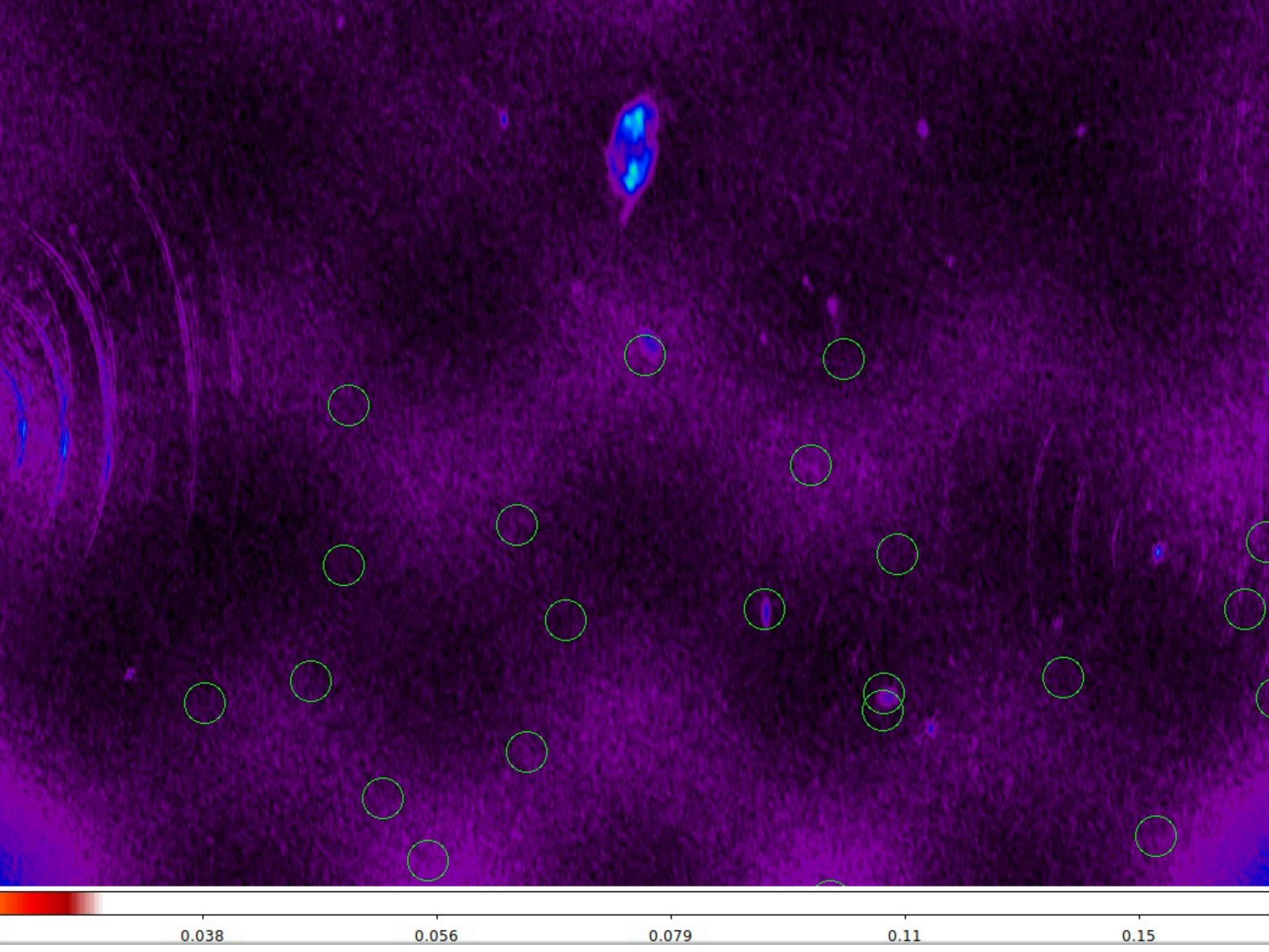
c2h_2
c2h_1
hn13c
sio
h13co+
hco
h13cn
so_1
ch3ch2cn
87.5
87.0
86.5
86.0

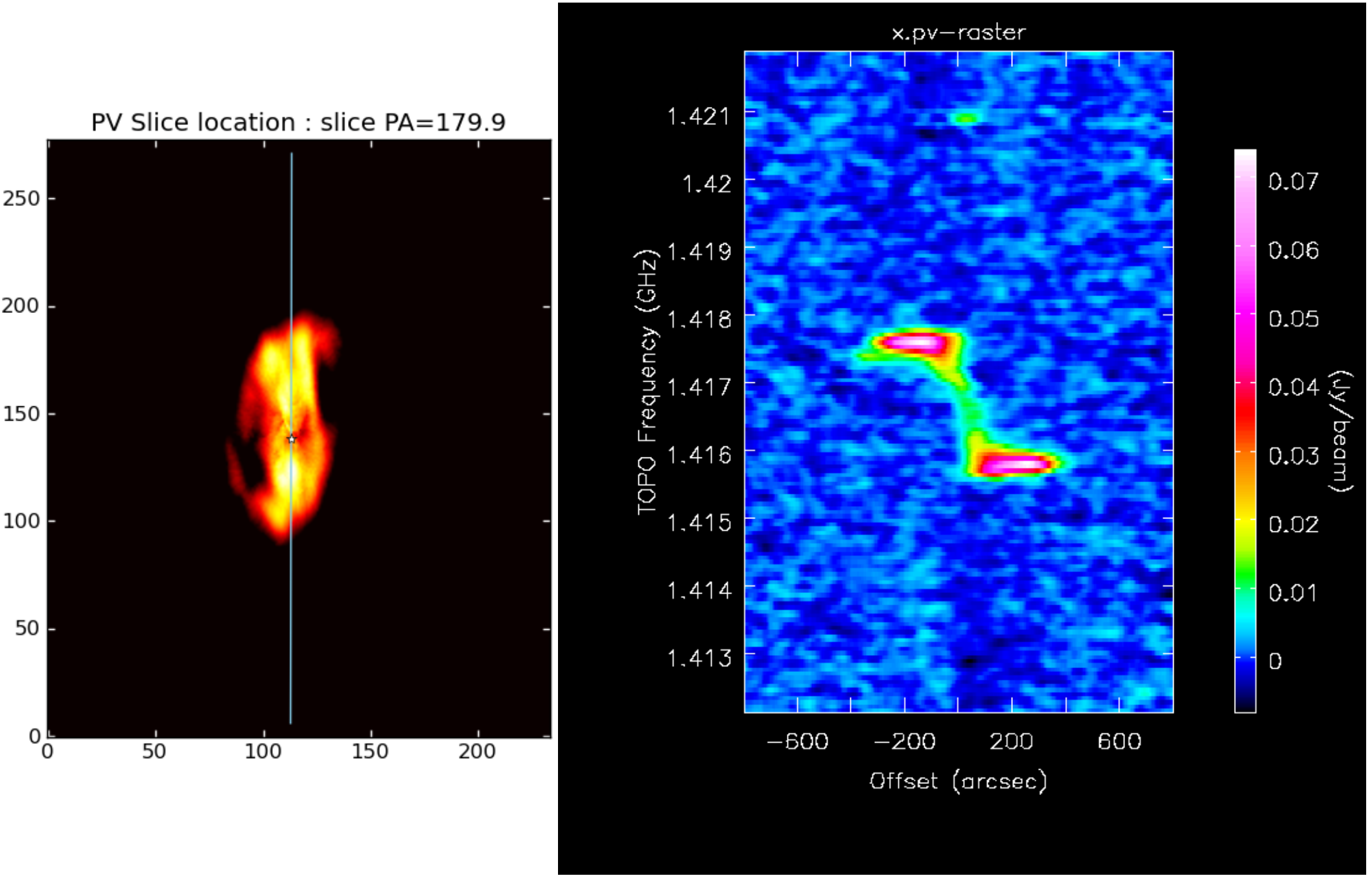

Summary Plot
NH2CHO_102.06427
CH3CCH_102.54798
H2CS_103.04055
Signal/Noise
Frequency (GHz)
0
100
200
300
400
102.0
102.5
103.0
103.5
CubeStat Max
CubeStat Min
CubeSpec0
CubeSpec1
CubeSpec5
CubeSpec6
CubeSpec7
CubeSpec8


x.csm-roster
38°
37°
36°
35°
J2000 Declination
13h21m
15m
12m
09m
06m
J2000 Right Ascension
3
2
1
0
−1
−2
(Jy/beam.Hz) x10^10

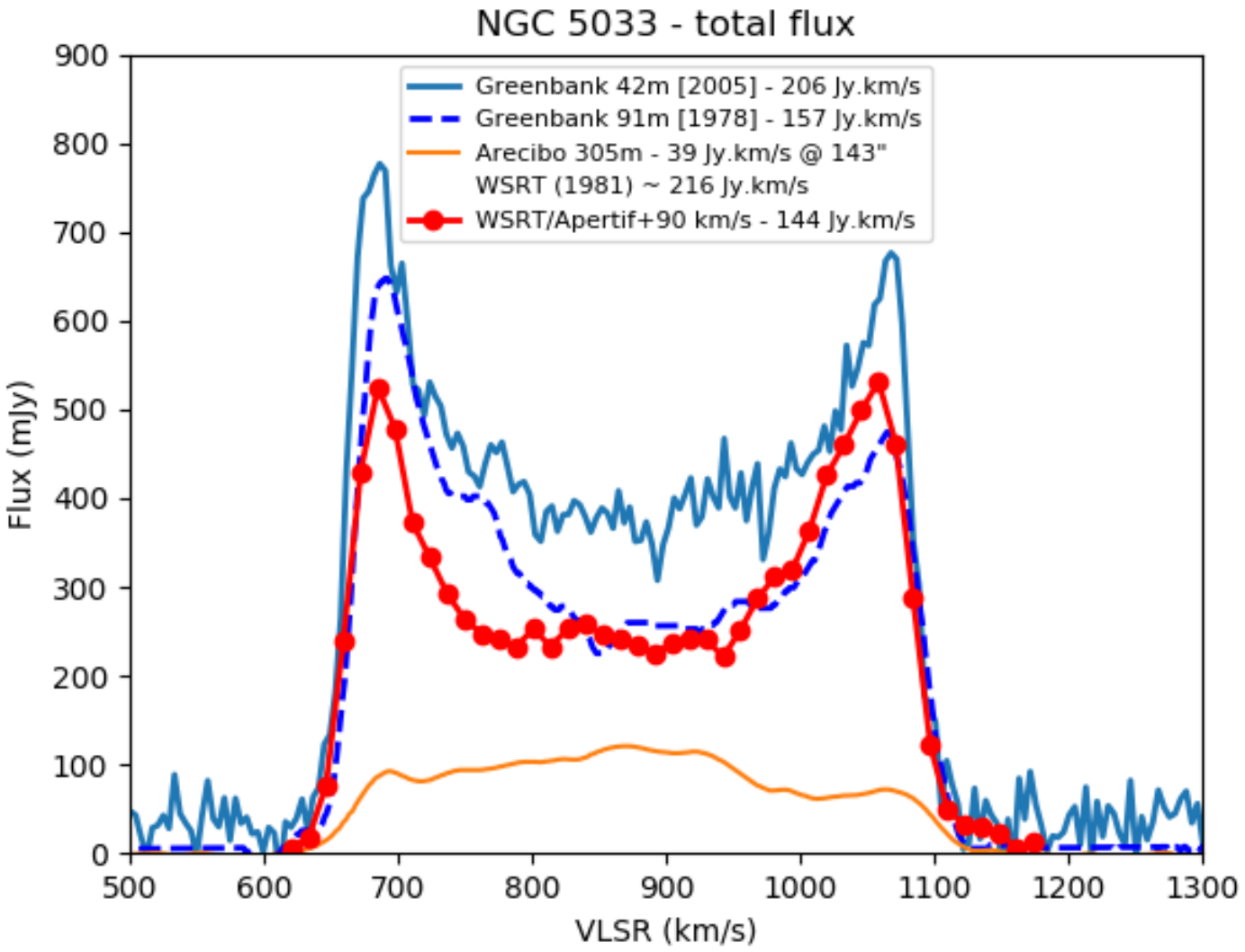

CubeStats: x.cst_0
log(peak)
log(rms noise)
log(peak/noise)
log(|minval|)
log(Peak,Noise,Peak/Noise)
Channel
3
2
1
0
−1
−2
−3
0
20
40
60
80
100
120
140
160


0.011
0.023
0.038
0.056
0.079
0.11
0.15
0.2
0.27


0.038
0.056
0.079
0.11
0.15


PV Slice location : slice PA=179.9
0
50
100
150
200
250
x.pv−raster
1.421
1.42
1.419
1.418
1.417
1.416
1.415
1.414
1.413
TOPO Frequency (GHz)
−600
−200
200
600
Offset (arcsec)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
(Jy/beam)

NGC 5033 – total flux



References

- ADMIT: https://github.com/astroumd/admit
- TP2VIS: https://github.com/tp2vis/distribute
- QAC: https://github.com/teuben/QAC
- ASCL: http://ascl.net

And I’ll leave you admiring this fabulous HI cluster/grouping