WSRT lessons for LOFAR

(Preliminary analysis of a 1x12h LFFE observation on 3C196)

- all-sky imaging at 115- 180 MHz
- ionospheric effects , e.g. large-scale TEC
- non-isoplanaticity and peeling
- stationary RFI-sources, crosstalk --> NCP
- ‘stable’ primary beams and beam-polarization effects
- good sensitivity (noise > LOFAR but << CS-1 HBA)

Ger de Bruyn,

LOFAR commissioning forum, 5 Dec 2007

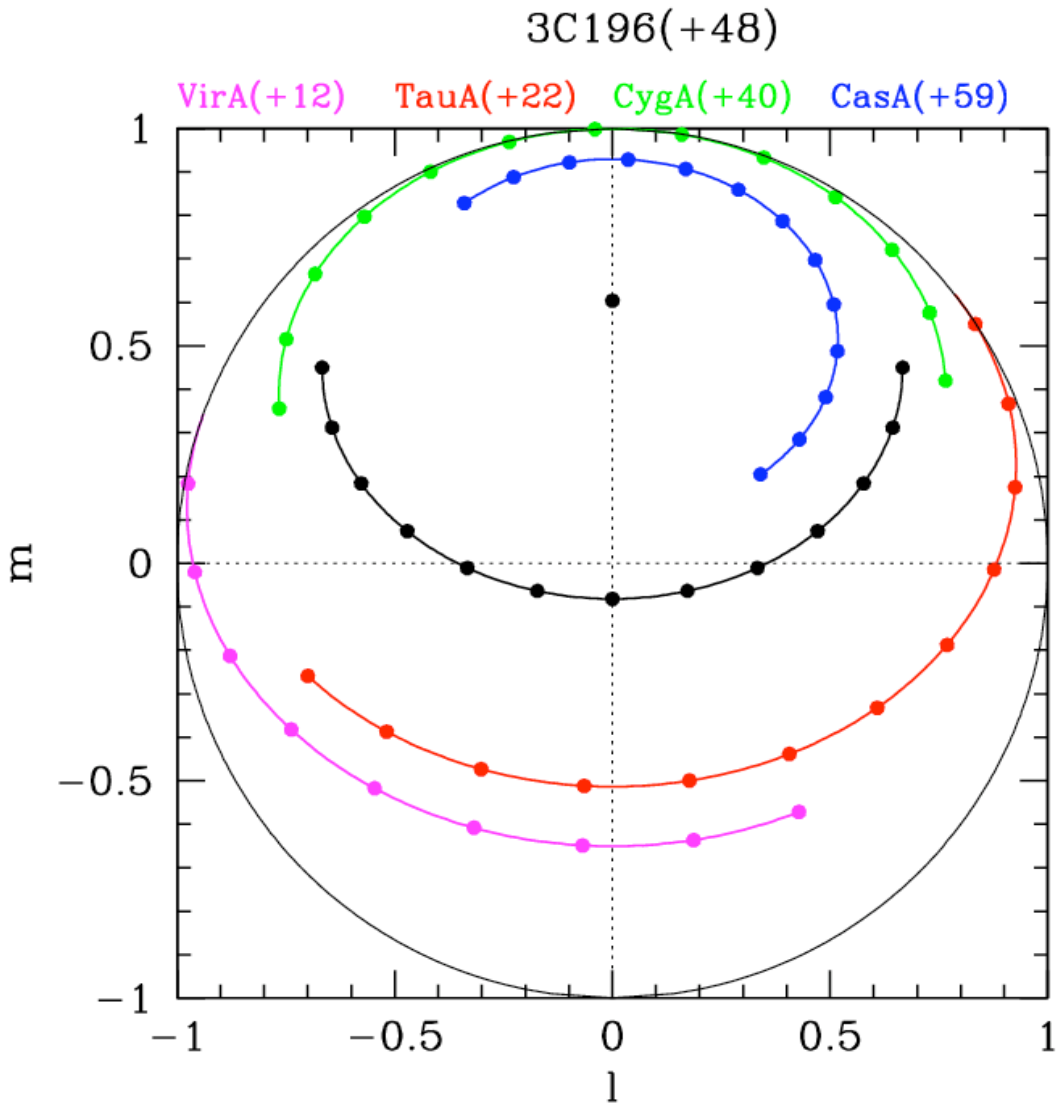
WSRT observations R08A/20 (for the EoR KSP)

Observations:

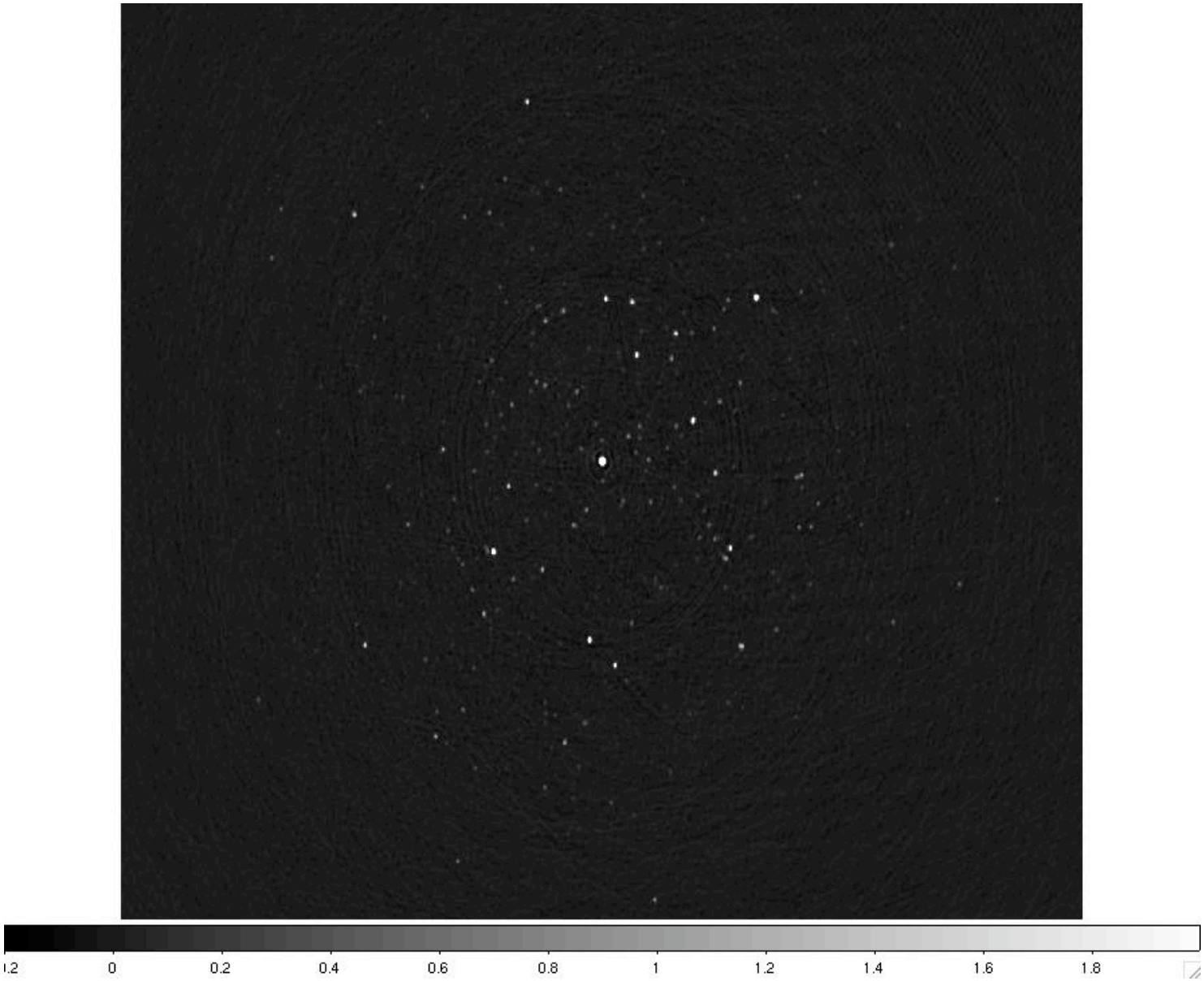
- 6x12h 21 Nov - 8 Dec 2007
- 13 telescopes 9A=36 (12) 96m
- 8 contiguous 2.5 MHz bands x 512channel x 4 pol
- Freq=139.3, 141.5, 143.7, 145.9 148.1, 150.3, 152.5, 154.7 MHz
- 10s integration
- 6 x 60 GByte raw data

- To be reduced using BBS
- Preliminary analysis (of 2% of 1x12h) in NEWSTAR

Celestial tracks of 3C196 and the A-team
12h WSRT from HA= -6h, +6h



~ 2’ resolution image of 12^ox12^o area near 3C196



NEWSTAR (NMODEL) list

Brightest 20 components (> 1.3 Jy) in 3C196 field

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   #       I         l         m        ID       Q     U     V     long  short   PA  S.I.   R.M.       -
           W.U.    arcsec    arcsec                 %     %     %    arcsec arcsec deg        r/m2

Sources at epoch 2000 at      08:13:36.05, 48.13.02.3, 139.300 MHz for WSRT
                              123.40022,   48.21730

    1 18681.227    -0.01     -0.10      1-00    0.8  -1.4  2.15   0.00   0.00    0  0.12     0.00     0.00
    2  2762.543 78790.22281257.59   1001-00   42.0 -12.9-18.29 120.00 120.00    0-10.28     0.00     0.00
    3  1720.469 -4880.93 -4072.02   1000-00    2.9   3.6  3.37   0.00   0.00    0 -0.21     0.00     0.00
    4  1590.141  -566.27 -8032.28   1000-00    3.9  -1.1  1.94   0.00   0.00    0 -0.74     0.00     0.00
    5  1430.641 -9420.23393694.88   1002-00  -15.1  -6.7 16.07  50.00  50.00    0 -9.64     0.00     0.00
    6  1406.941  6924.38  7348.50   1000-00    6.1   0.7  4.54   0.00   0.00    0 -1.07     0.00     0.00
    7  1283.235 -9448.82393684.53   1003-00  -25.5  -9.7 19.40  50.00  50.00    0 -9.64     0.00     0.00
    8   693.006  1554.86  4773.06   1003-00    1.6  -0.8  2.51   0.00   0.00    0 -0.47     0.00     0.00
    9   574.986   161.83  7287.57   1015-00    1.4  -1.5  2.64   0.00   0.00    0 -0.95     0.00     0.00
   10   574.872  5740.35 -3905.51   1006-00    1.9  -7.2  2.03   0.00   0.00    0 -0.24     0.00     0.00
   11   516.466 -3387.32 16138.18   1014-00   12.8  -2.4  0.81   0.00   0.00    0 -4.99     0.00     0.00
   12   476.623   567.25 -9173.97   1002-00    4.2  -2.8 -0.25   0.00   0.00    0 -1.07     0.00     0.00
   13   471.653  5088.64  -536.67   1009-00    2.0  -4.3  2.03   0.00   0.00    0 -0.49     0.00     0.00
   14   438.515  1342.10  7145.87   1002-00    3.3   0.2 -0.36   0.00   0.00    0 -1.03     0.00     0.00
   15   423.103  4066.91  1801.20   1000-00    9.6  -8.4 -0.52   0.00   0.00    0 -0.36     0.00     0.00
   16   418.443-11135.78 11070.11   1013-00    3.8  -7.9  3.93   0.00   0.00    0 -3.88     0.00     0.00
   17   371.309-10667.25 -8262.61   1004-00   12.5  12.4 -5.26   0.00   0.00    0 -1.54     0.00     0.00
   18   356.730 -4224.35 -1129.07   1031-00    1.0   0.5  2.24   0.00   0.00    0 -0.24     0.00     0.00
   19   340.655  3305.74  5726.75   1011-00    3.4  -1.0  2.42   0.00   0.00    0 -0.62     0.00     0.00
   20   271.771 -7487.36-12362.86   1228-00   14.3  14.0  0.55   0.00   0.00    0 -2.45     0.00     0.00

20 sources (0 deleted) with 34803.328 W.U. (Max= 18681.227, Min= 271.771)
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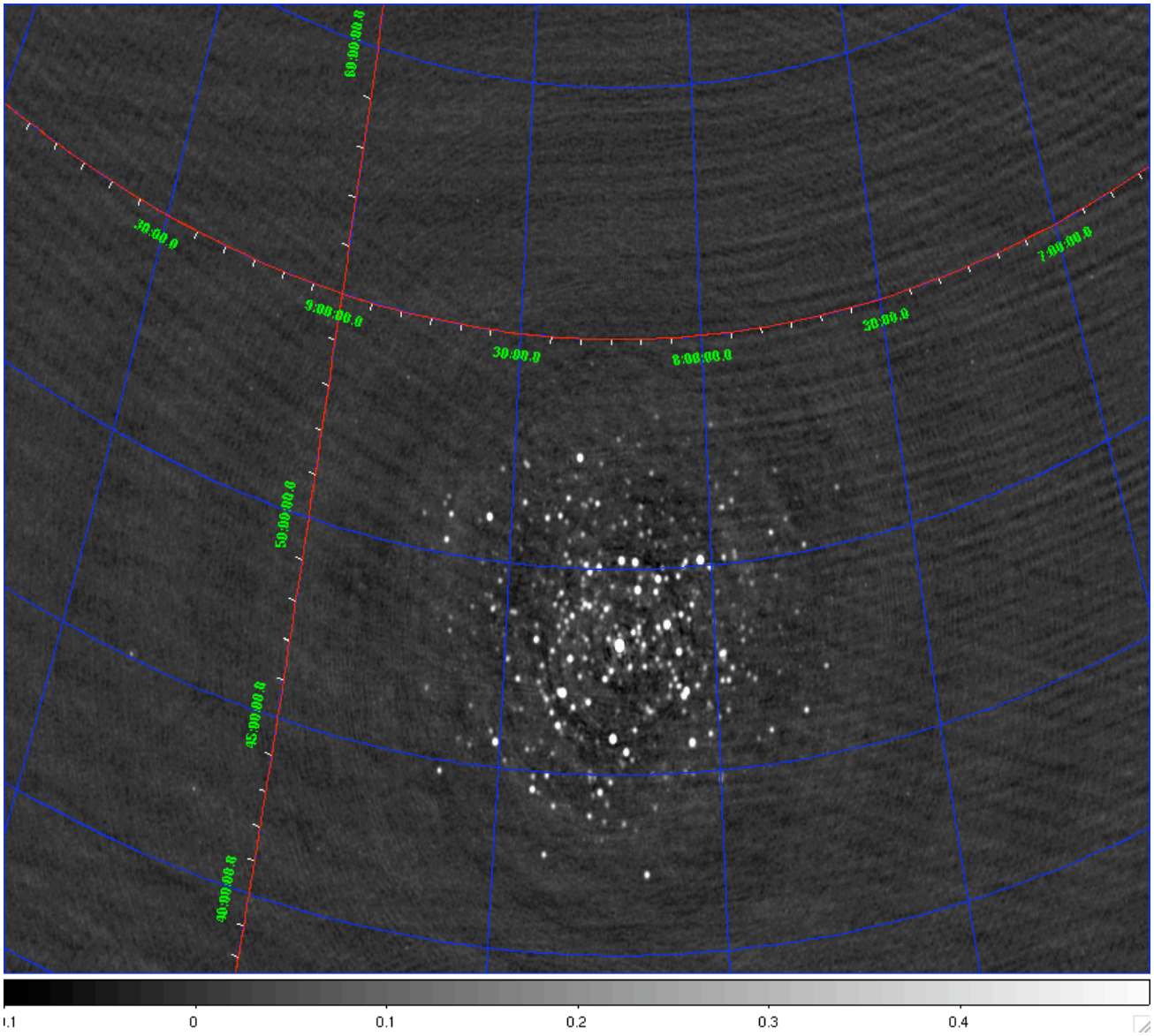
3C196

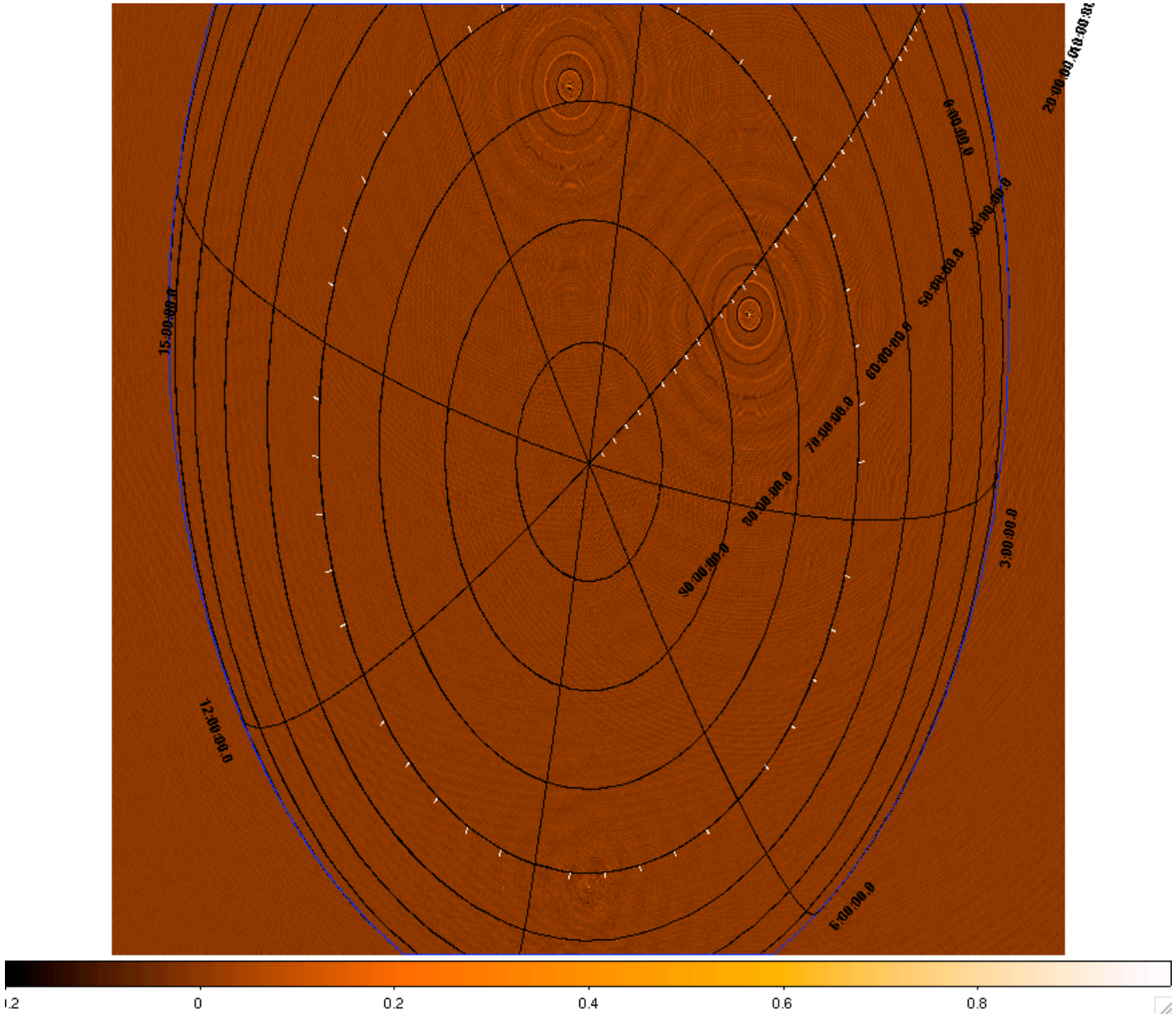
CasA

CygA

~ 5’ resolution image of 20^{o} area near 3C196



WSRT all-sky image 3C196 (138-157 MHz)



NCP - l,m projection of 3C196 and the whole sky as seen by WSRT