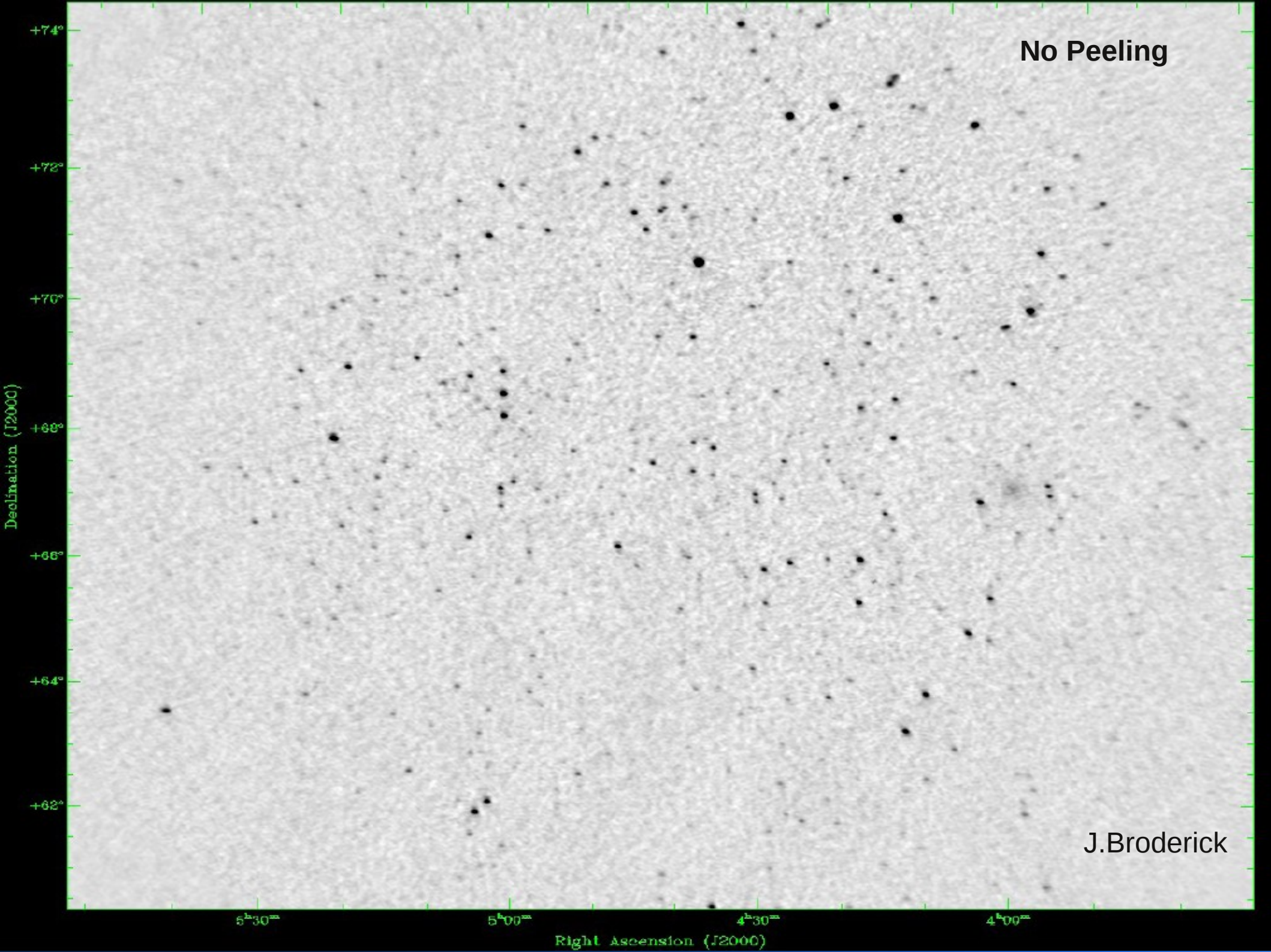


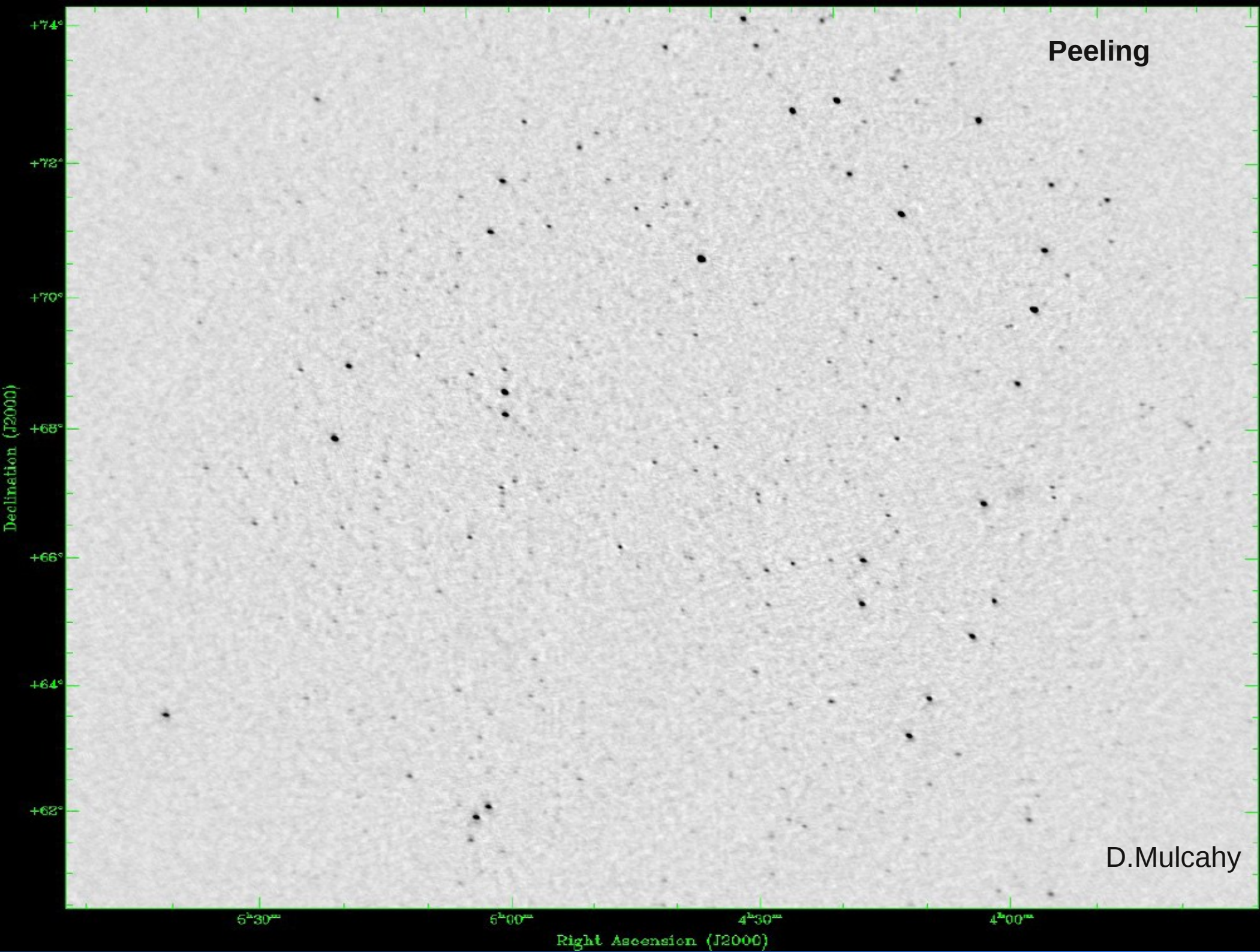
Recent Commissioning Progress on M51- Peeling methods

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(MPIfR)
MKSP

Some Background

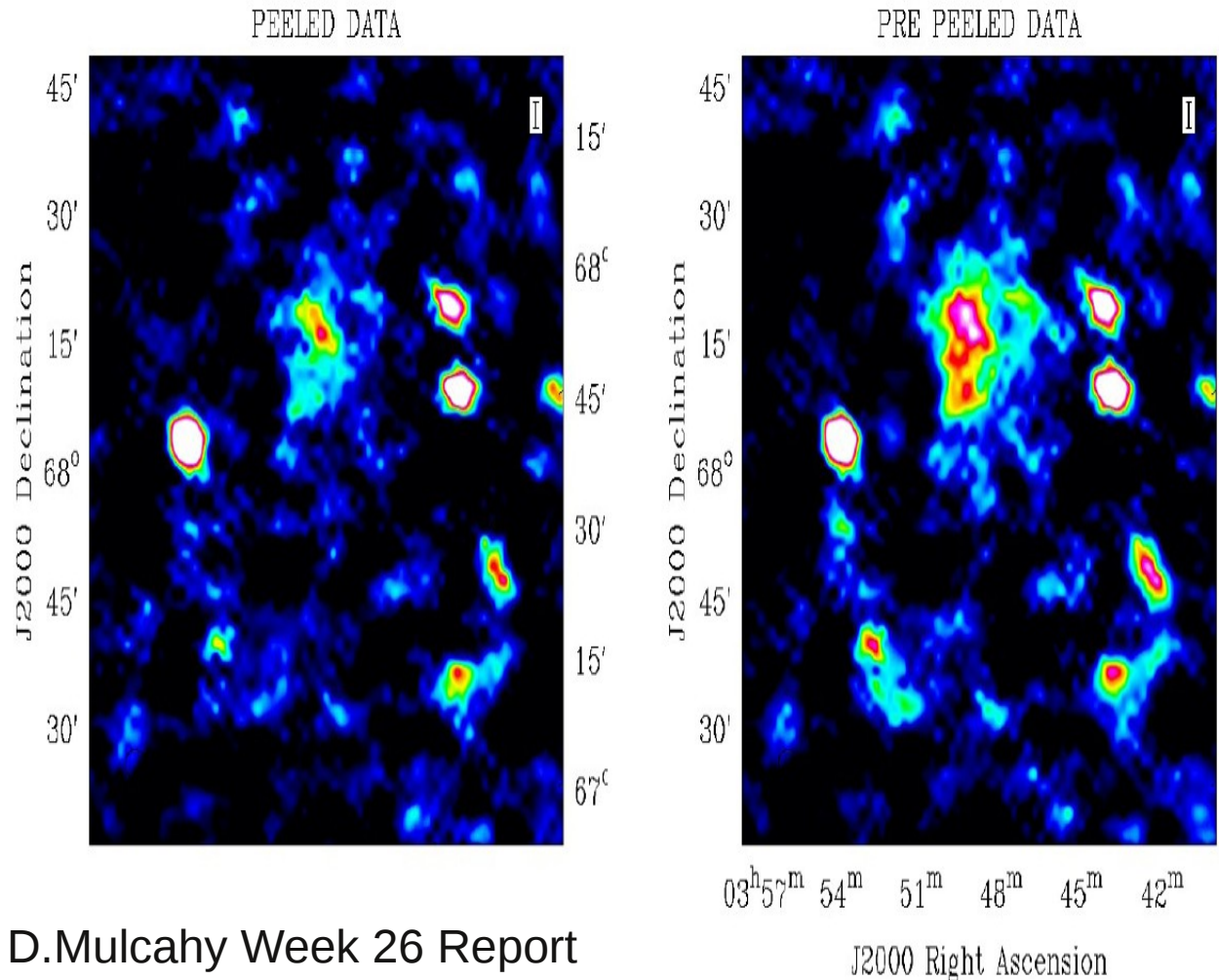
- Since July, MSSS have been using a very effective process to peel sources developed by Mike Bell.
- 20%-30% decrease in noise was seen and produced excellent images.





Some Background

- However, it was seen that the flux in extended emission was decreased substantially. To the left shows IC0342 before and after peeling. See report by D.Mulcahy (Week 26)
- It was also seen by Blazej (week 37-38) that decreasing the time cellsize from 5 to 1 increased the flux by 6% (-40% to -34%).



Different Approaches to Peeling

- Case 1

Normal Global SkyModel (from gsm.py, with Time cellsize = 5 & 1)

- Case 2

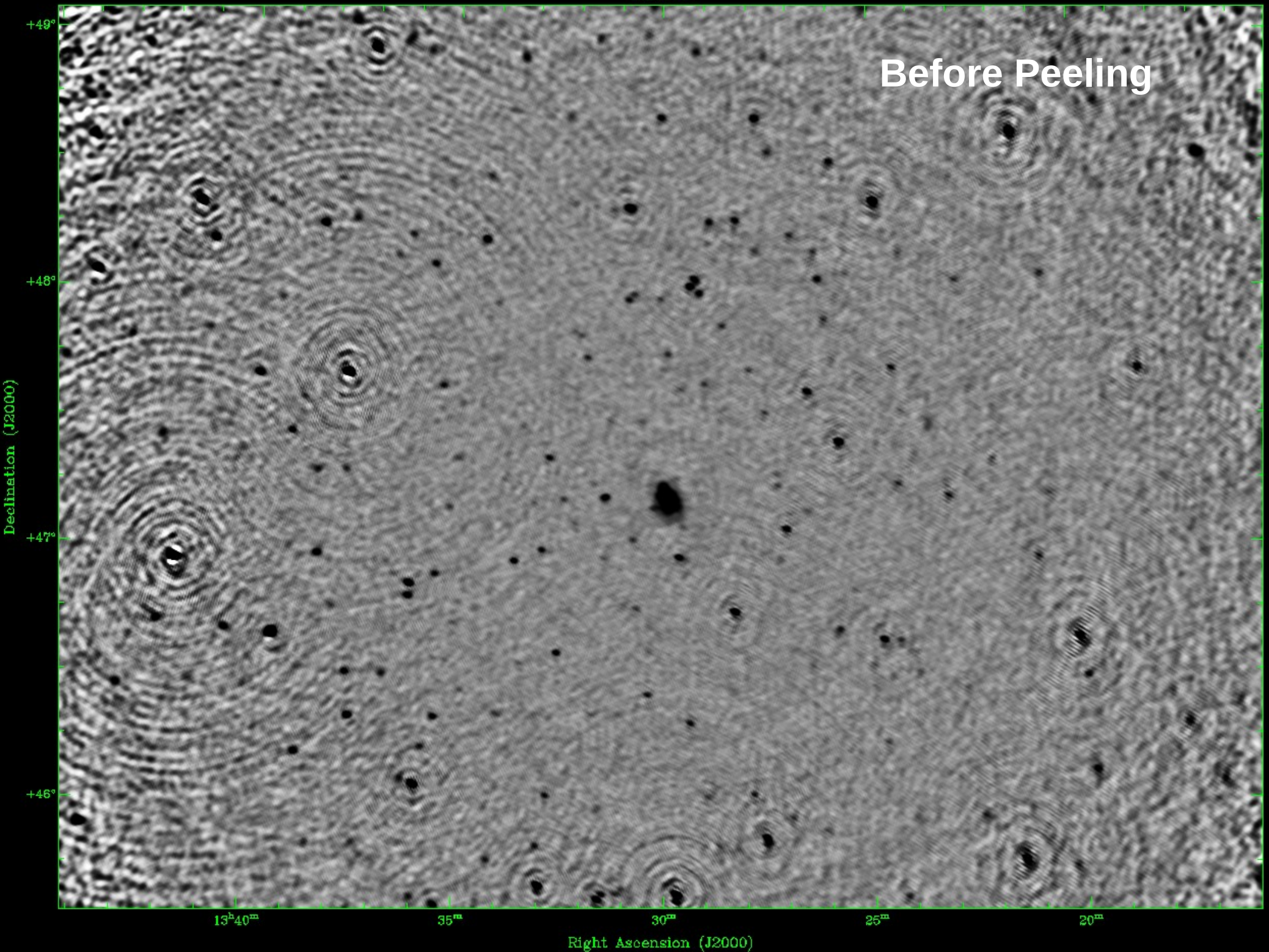
Clean Component model taken from awimager

- Case 3

Clean Component model taken from awimager and casapy

BEAM→0

Before Peeling

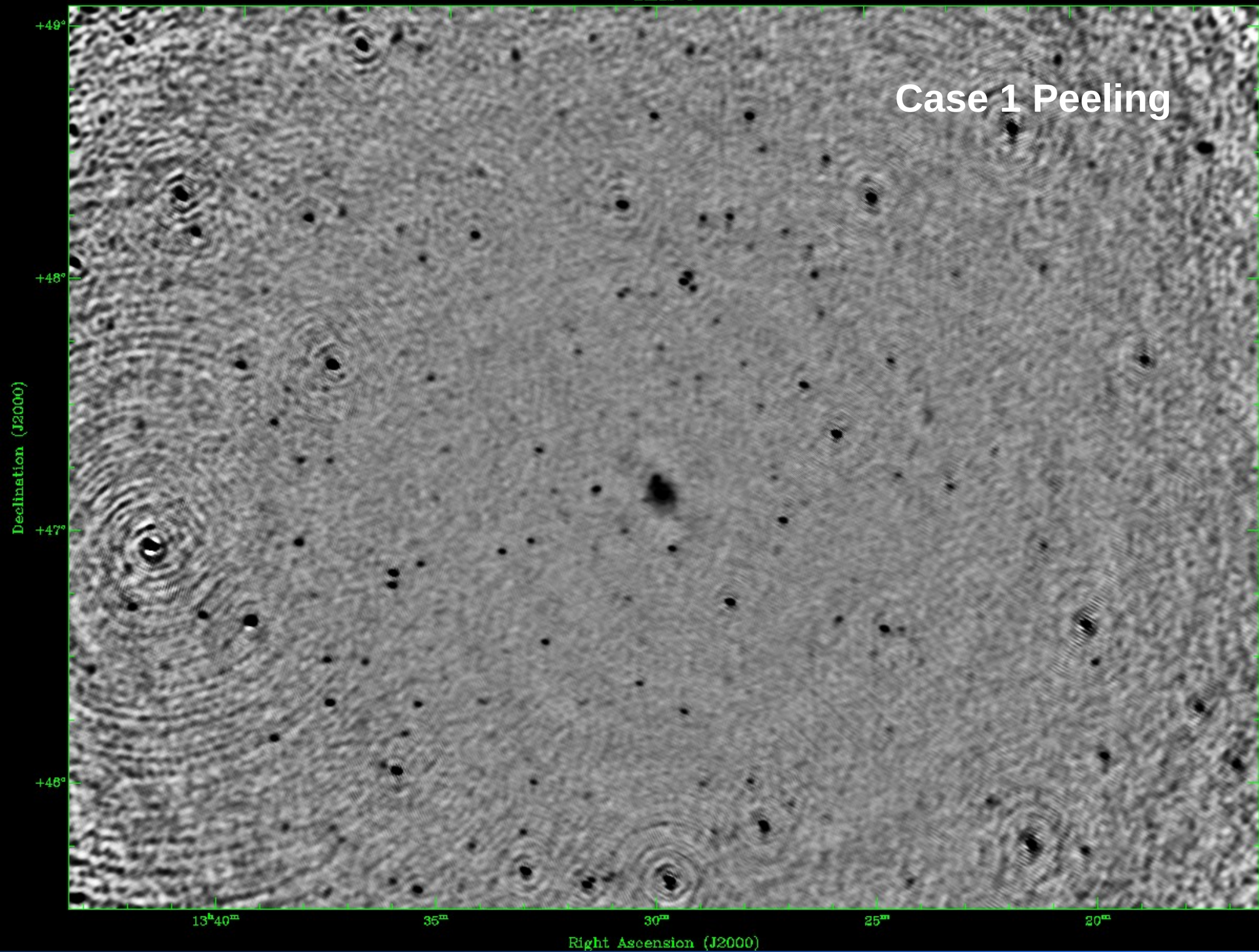


Case 1

- Use normal gsm model, peel 4 sources
- M51 described by a Gaussian only
- Decrease in Flux agreed with Blazej's previous work of 40% (Time cellsize=5) and 34% (Time cellsize=1)

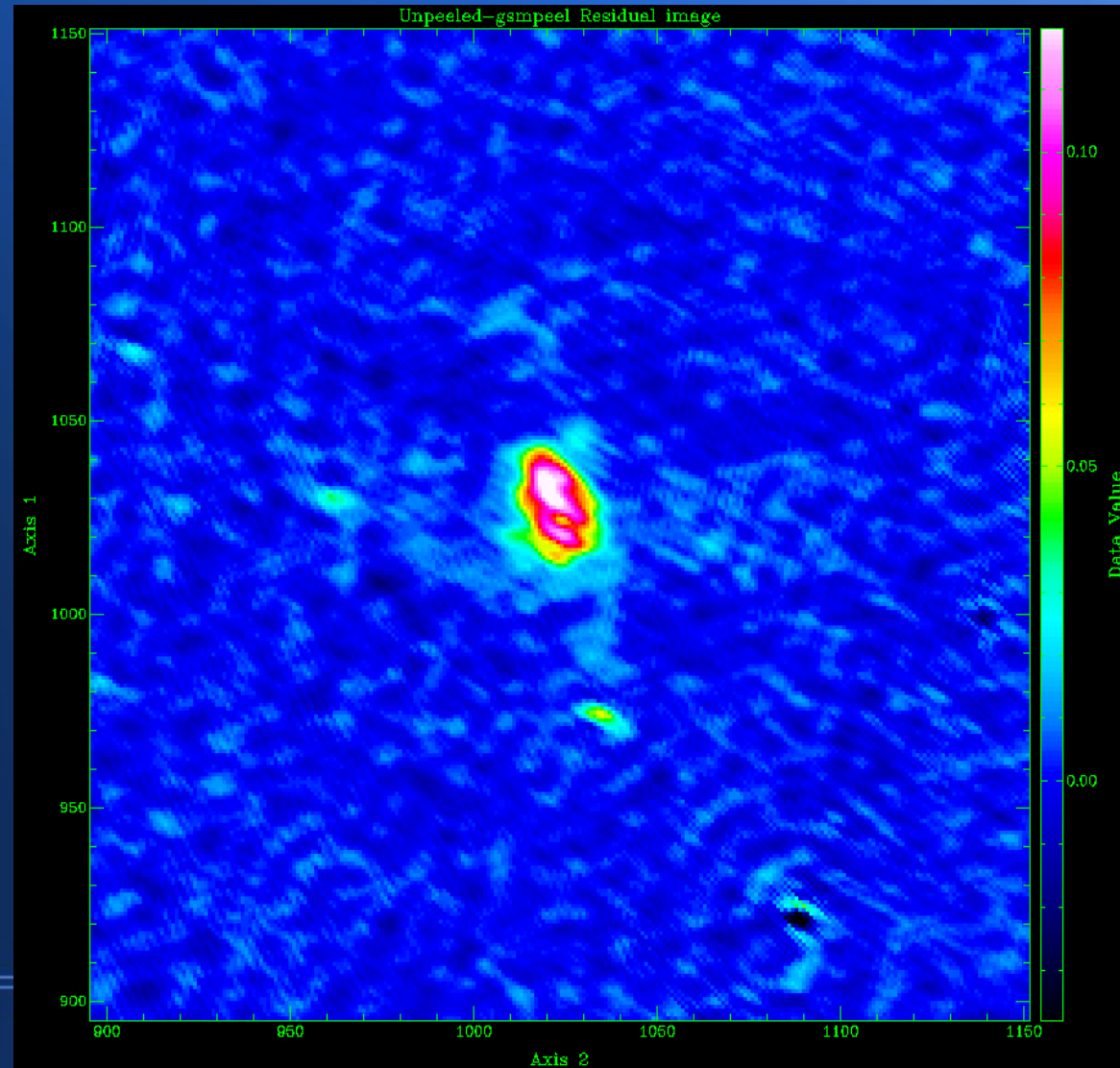
BEAM→0

Case 1 Peeling



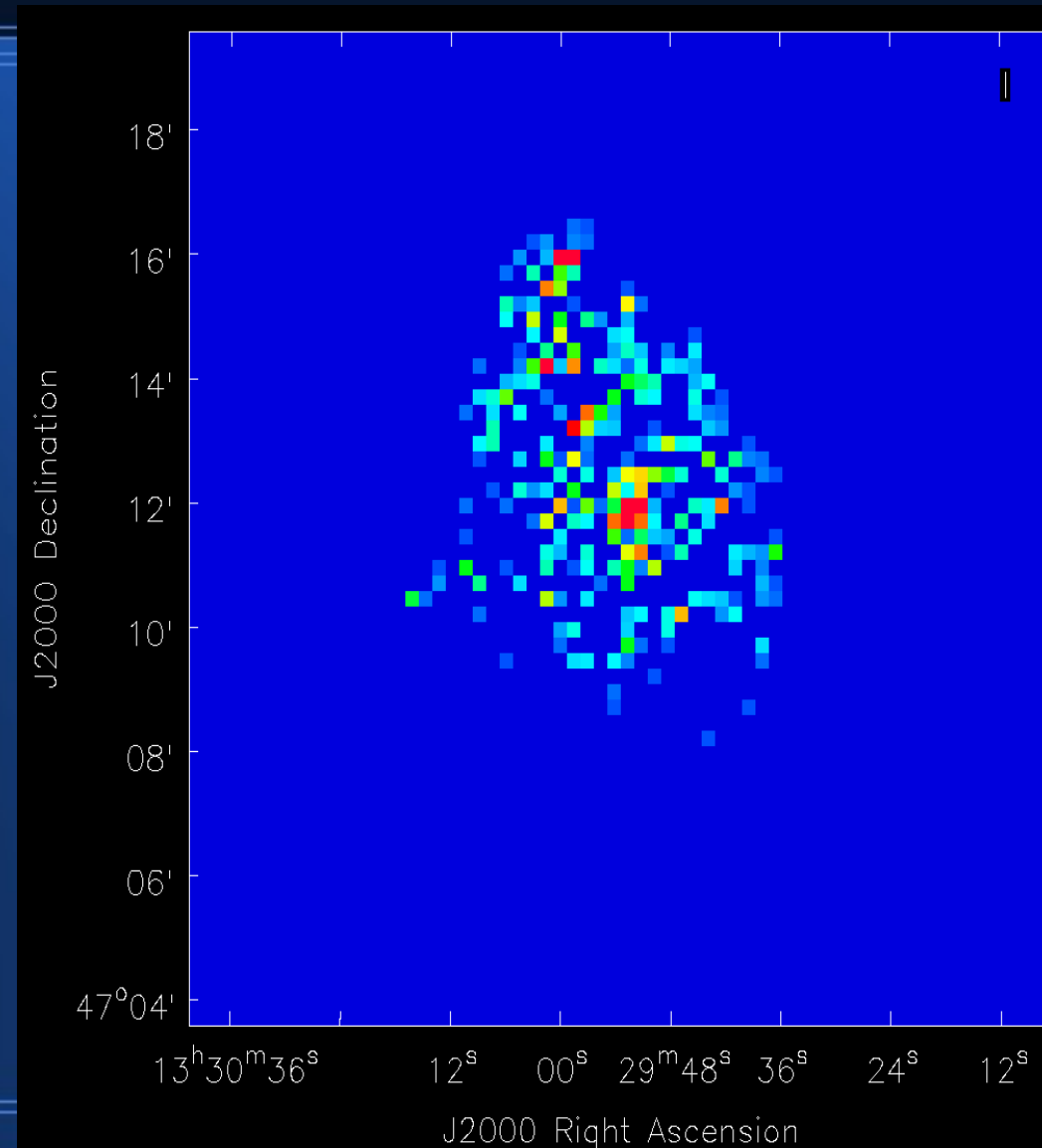
Case 1 : Global Sky Model Peeling

- Residual image to the left shows the difference in flux occurs over the whole region of the galaxy.



Case 2: CC model extracted from awimager

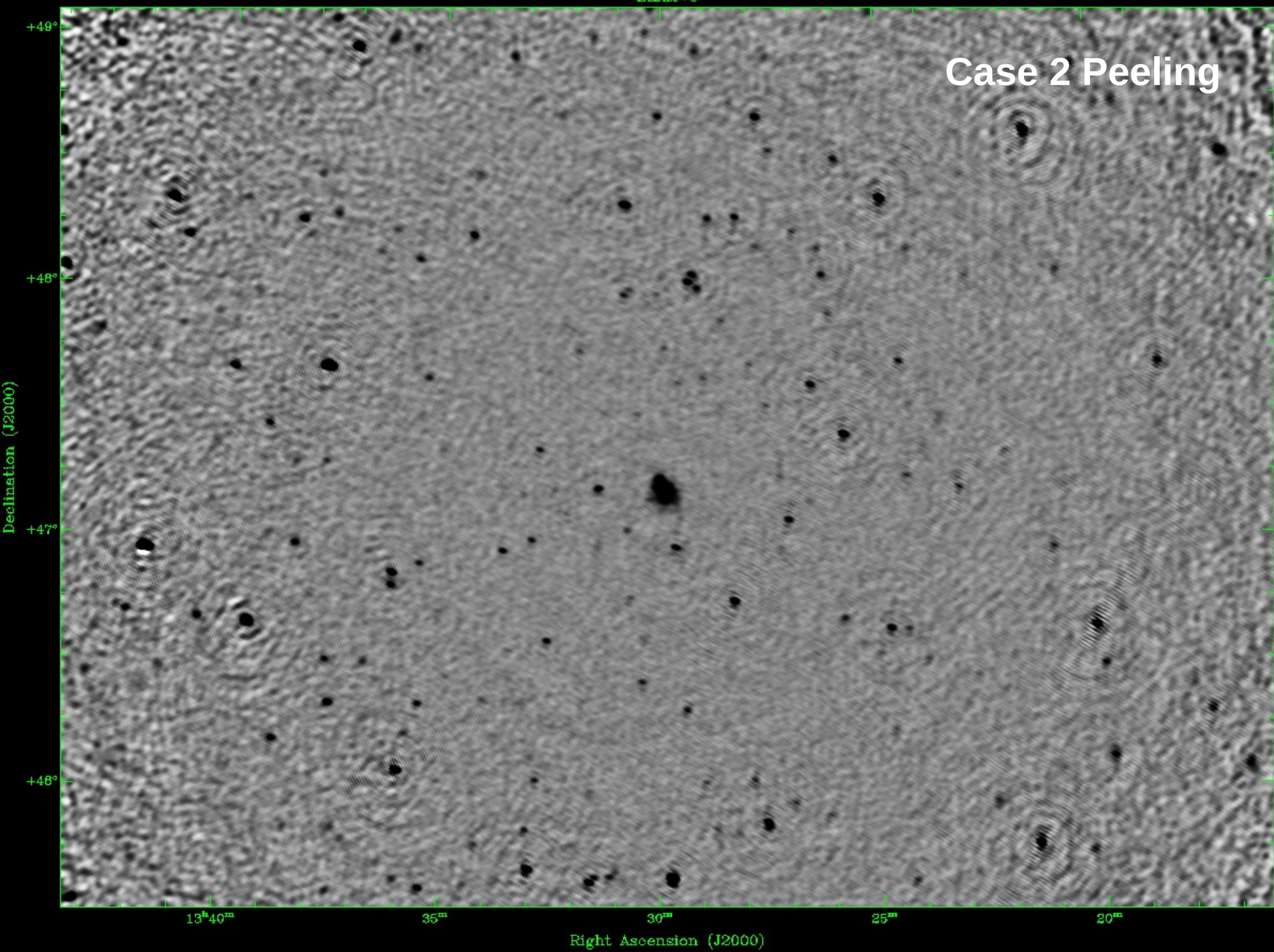
- Used normal default values when using awimager.
- Resulting cc model of M51 shown on the left.



Just over 200 points in this model.

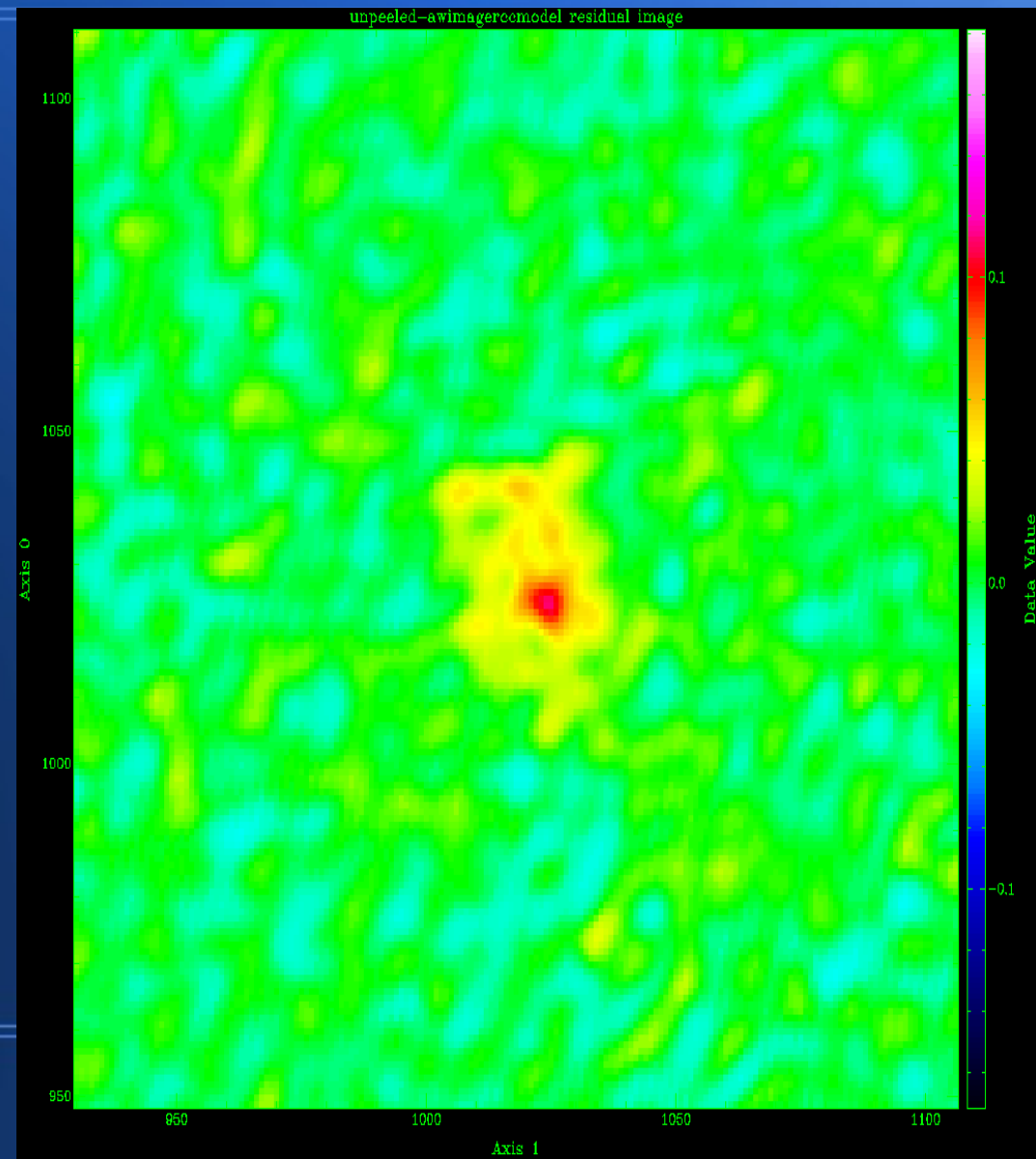
BEAM→0

Case 2 Peeling



Case 3: CC model extracted from awimager

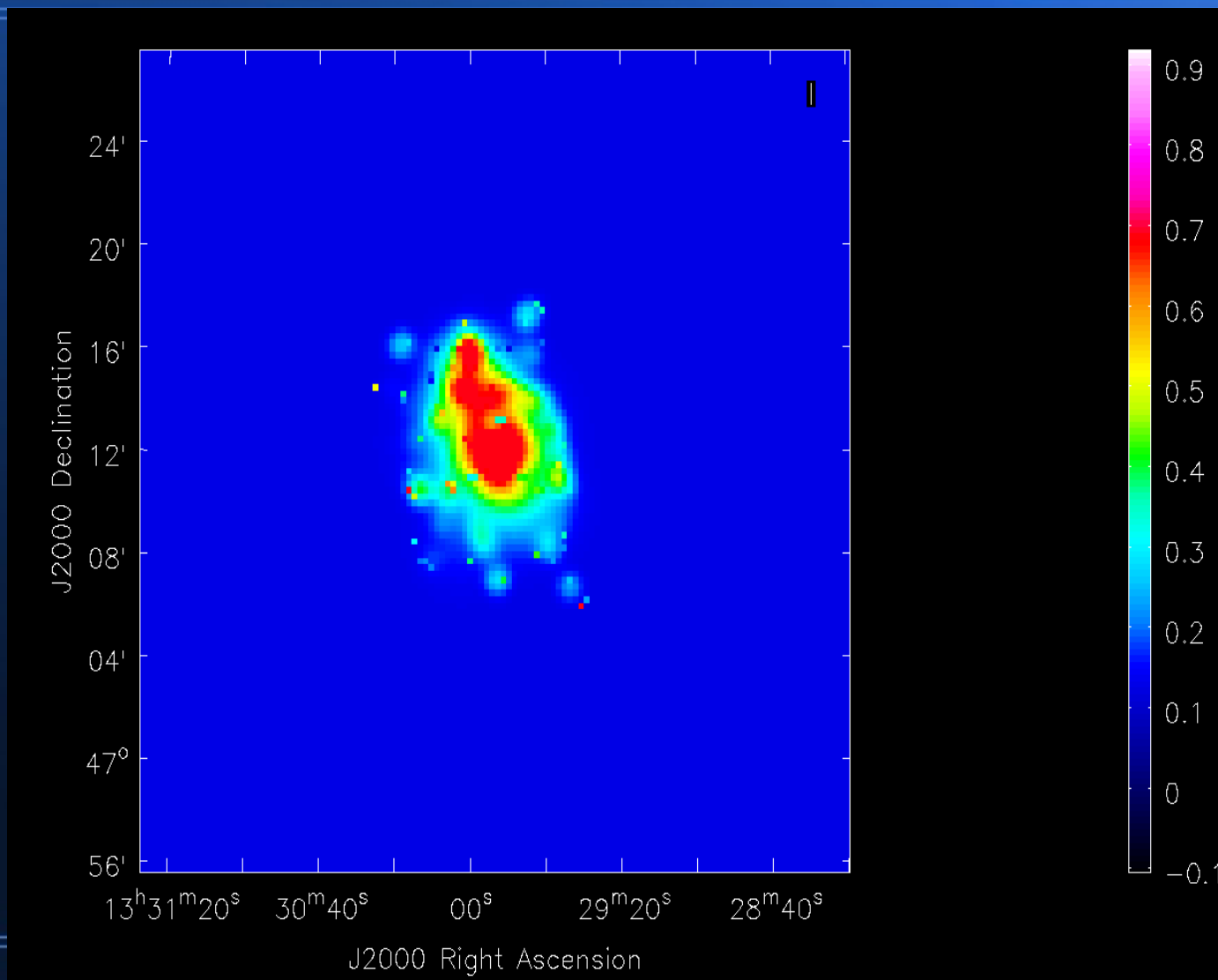
- Overall quality and noise of the image is better.
- Missing Flux is now only 20%. Must need to extract a more complete skymodel from cleaning.



Case 3: CC model extracted from awimager & casapy

- Clean Components of point sources were taken from awimager and then modeled using casapy2bbs.py.
- M51 model was extracted from using casapy. Multi-scale cleaning was used.

Case 3: CC model extracted from awimager & casapy



Over 1200 points in the model

BEAM→0

Case 3 Peeling

Declination (J2000)

+49°

+48°

+47°

+46°

13^h40^m

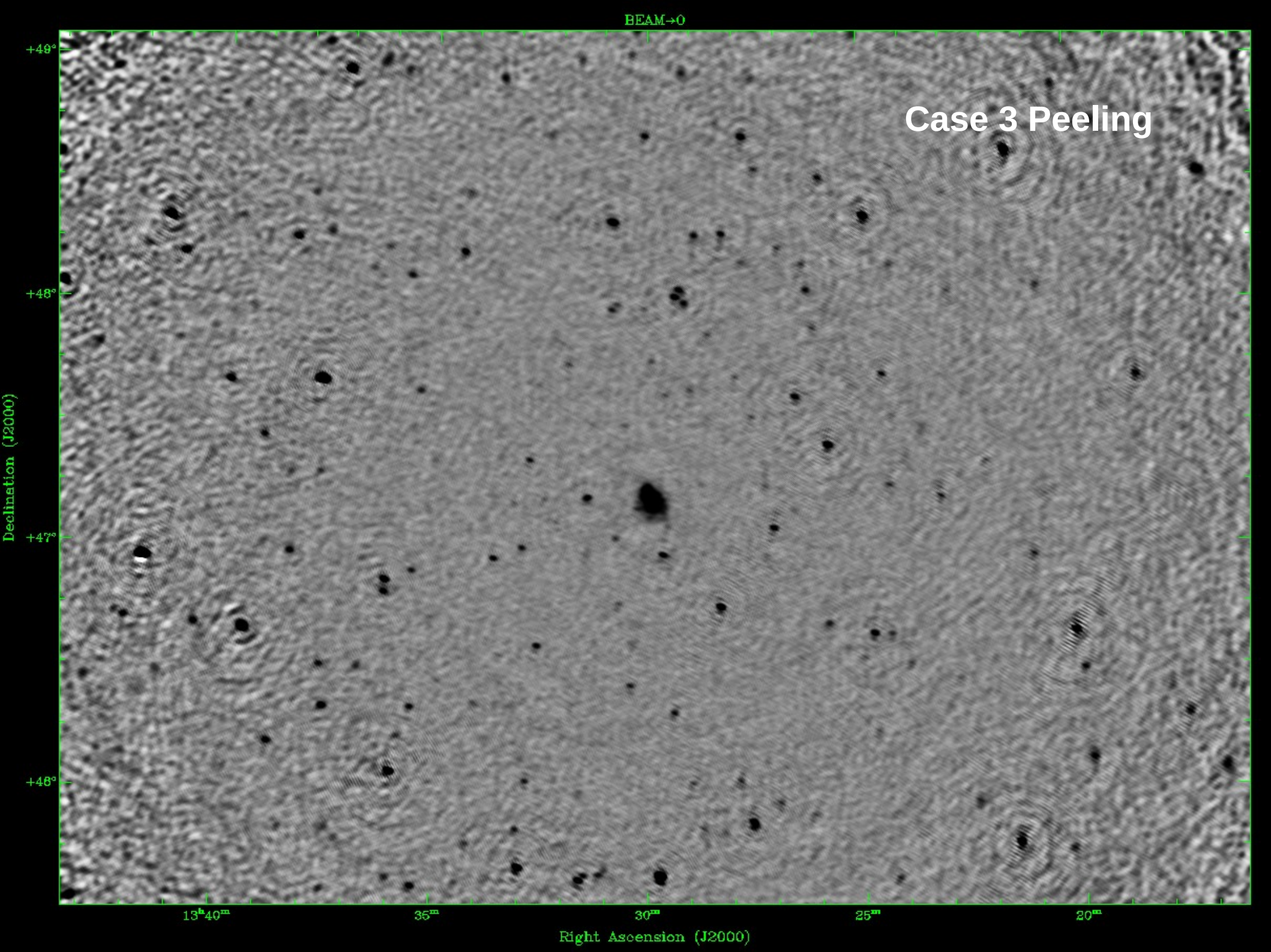
35^m

30^m

25^m

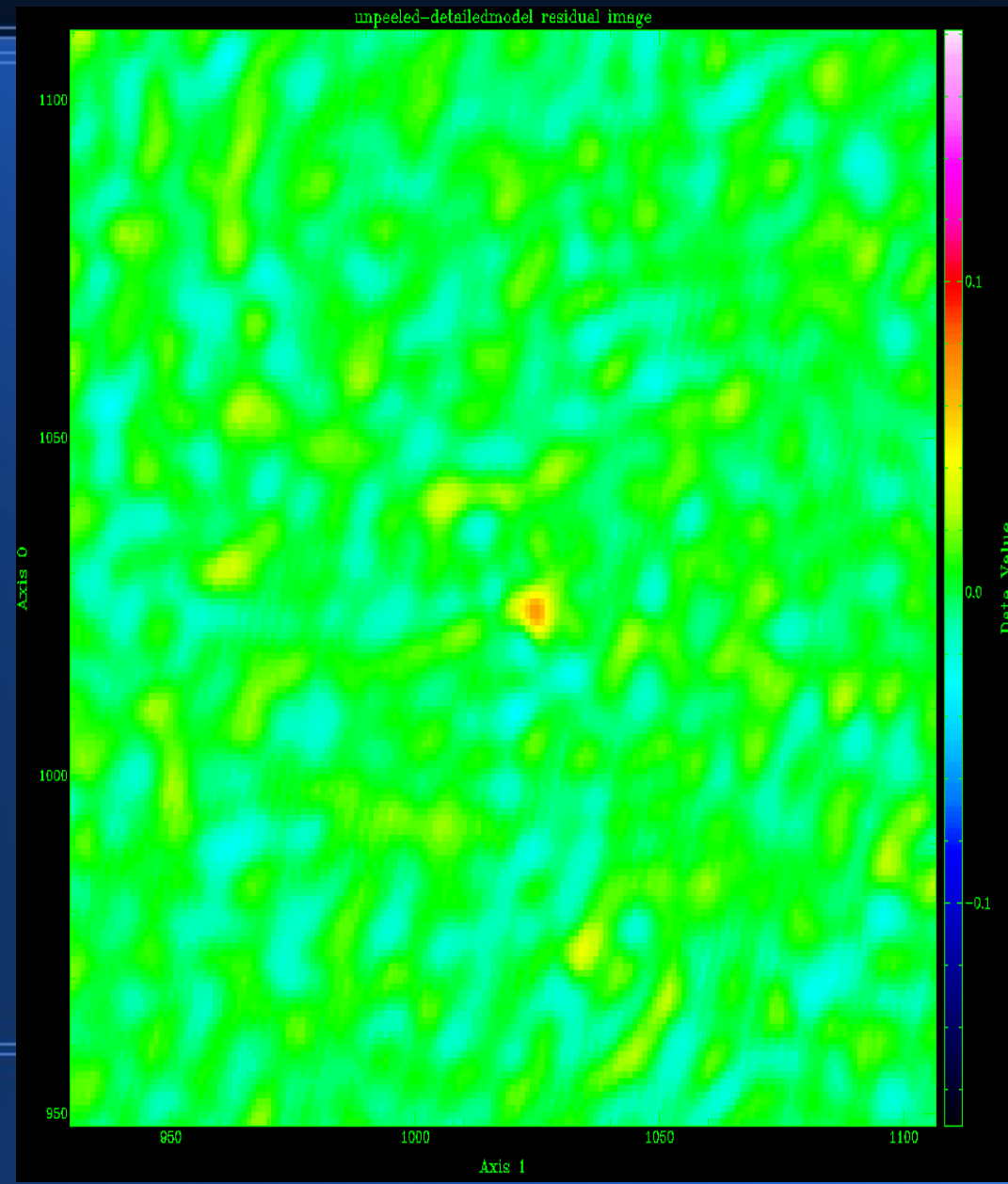
20^m

Right Ascension (J2000)



Case 3: CC model extracted from awimager & casapy

- Missing flux from extended emission is now only 2% which is from central region only.
- Possible to get this difference to less than 1%.



Conclusions

In order to avoid a reduction in extended emission when peeling, an extremely detailed model of the extended emission is needed.

Using awimager cc model for the point sources and a casapy cc model for the extended emission gives near perfect results (1-2% difference).

Multi-scale cleaning helps very well in extracting this extended source's skymodel.

Not sure how accurate this method will be for extended emission away from the phase center.