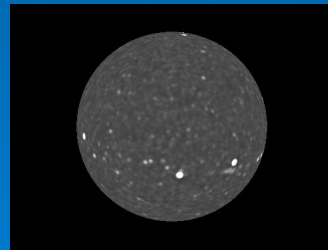


LOFAR proto-GSM

Reinout van Weeren

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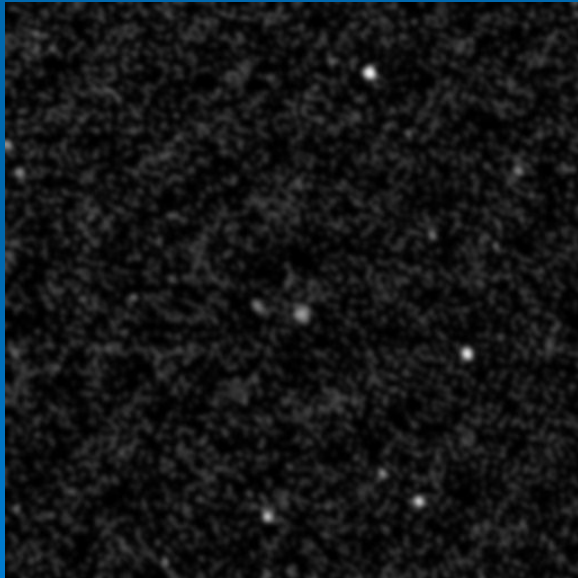
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Overview

- **1. Create a Global Sky Model (GSM) by using the images of existing surveys**
- *2. Source extraction (BDSM, Niruj Mohan)*
- *3. Compare flux densities and positions of sources*

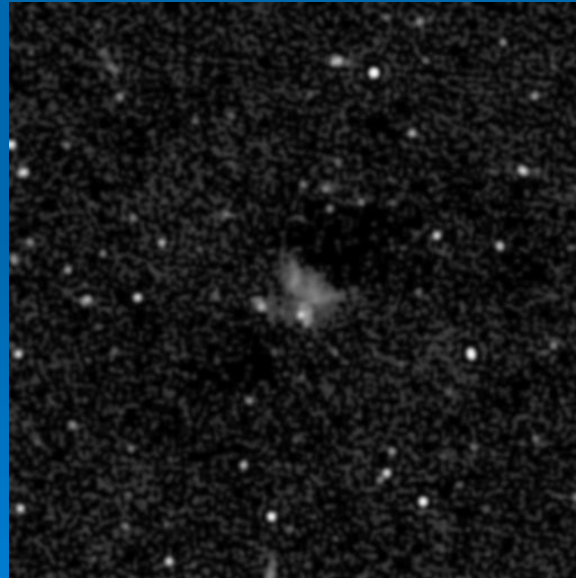
VLSS

- 74 MHz
- 80"
- 0.1 Jy/beam
- > -30°



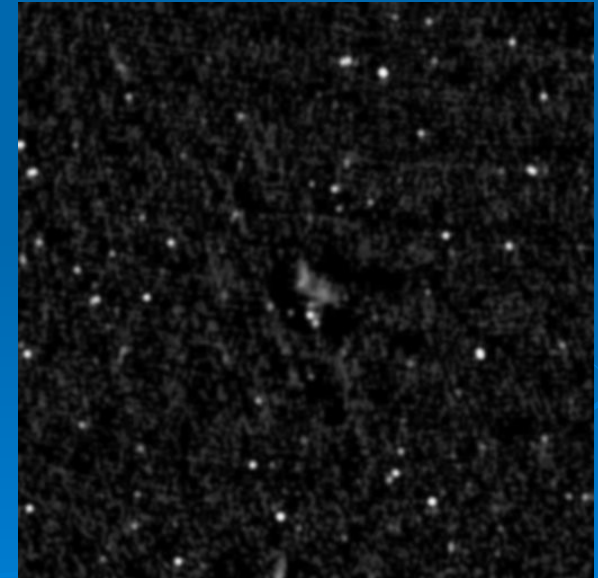
WENSS/WISH

- 325 MHz
- 54" × 54" cosec(δ)
- 18 mJy 5 σ rms
- $\delta > 30^\circ + -9^\circ < \delta < -26^\circ$



NVSS

- 1.4 GHz
- 45"
- 2.5 mJy 5 σ rms
- $\delta > -40^\circ$



➤ Which sky models can we make given those three surveys?

- 0.5 KM LOFAR **30/75/120/200** MHz
- 2 KM LOFAR **30/75/120/200** MHz
- 10 KM LOFAR **30** MHz

Making a sky map with “Classic” AIPS

- Update file headers (epoch, beams, etc.)
- Create $15^\circ \times 15^\circ$ tiles for each survey
- Convolve to various LOFAR resolutions
- Resample maps

Issues

- Convolution with very large beams:
 - convolving beam \approx original tile size
- Projection:
 - sky is distorted by the projection used
- Resolution of surveys are limited:
 - we cannot simulate a 100 km LOFAR sky model using the survey images

15° × 15° tiles with a lot of overlap

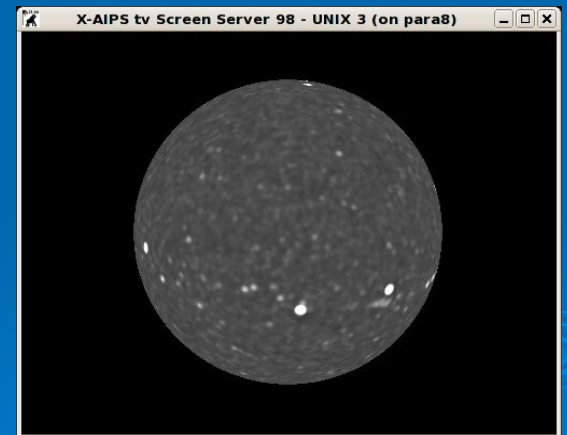
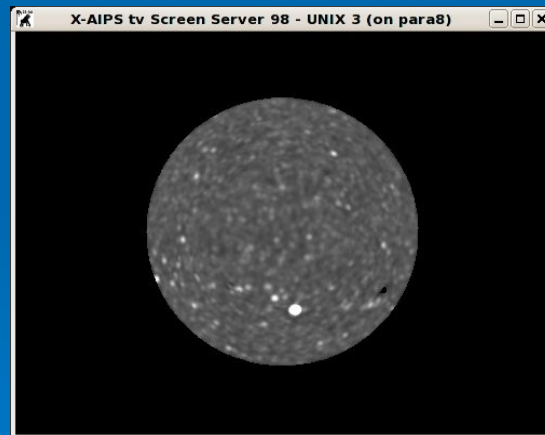
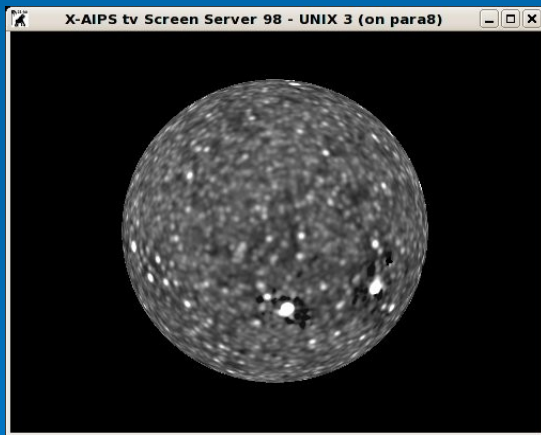


0.5 KM LOFAR 30 MHz, $\sim 1.7^\circ$

VLSS, 74 MHz

WENSS, 325 MHz

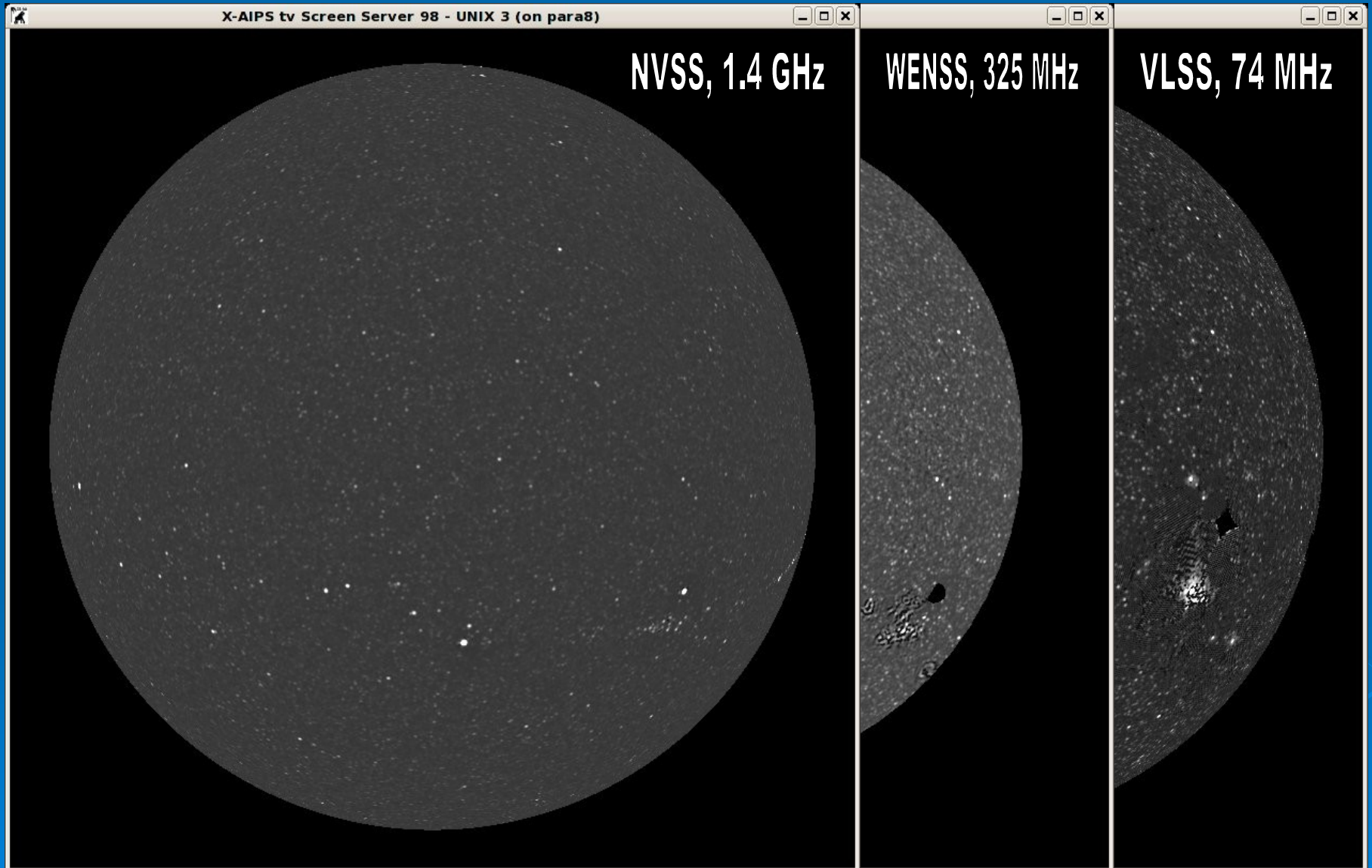
NVSS, 1.4 GHz



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2 KM LOFAR 30 MHz, ~21'

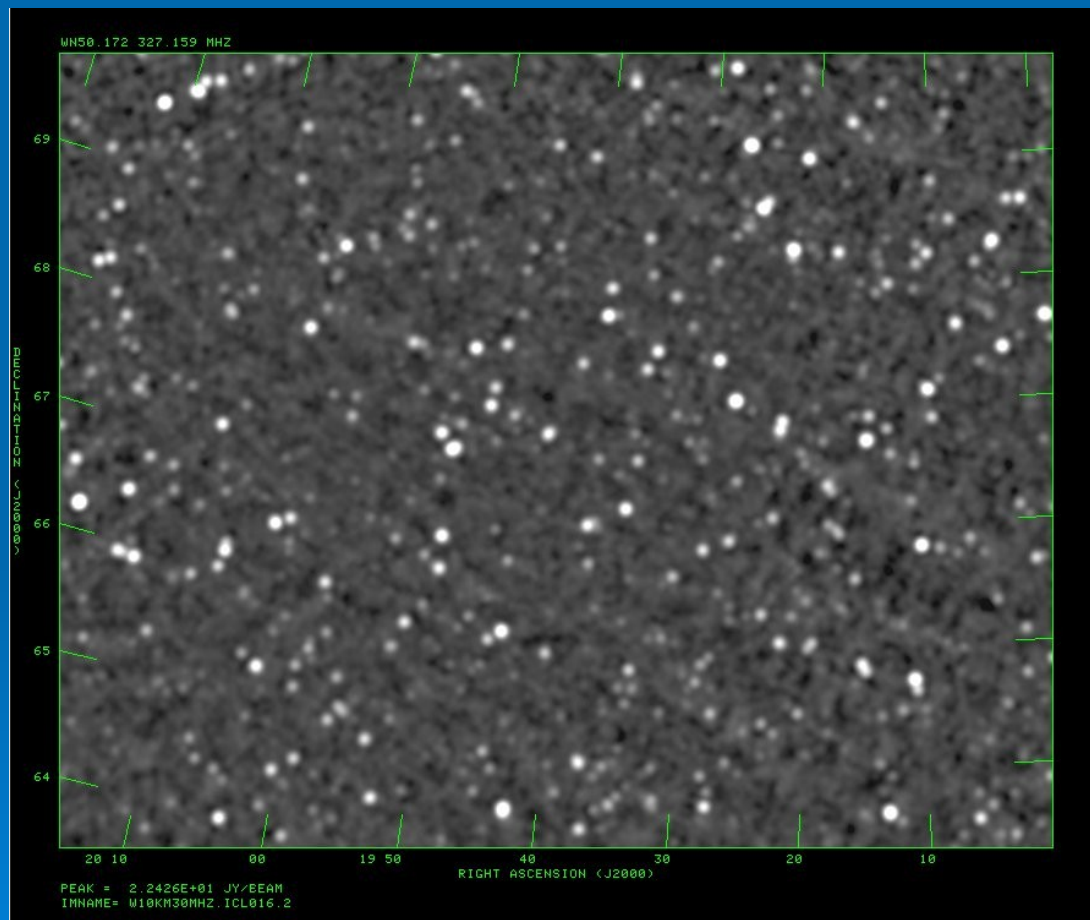


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10 KM LOFAR 30 MHz, ~4'

WENSS



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Radio Sky $\delta > 0^\circ$, 0.5 KM LOFAR 75 MHz

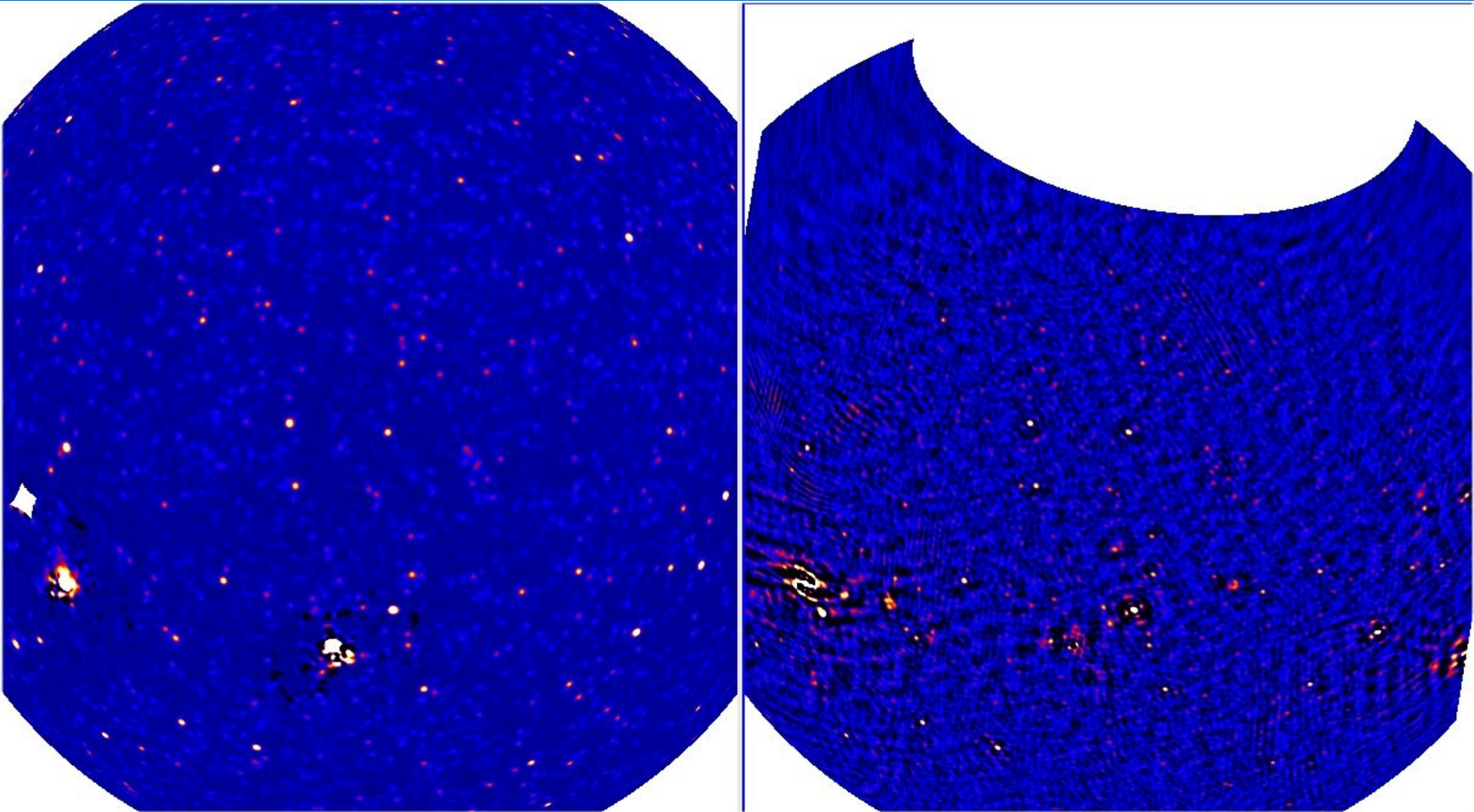


Red: VL
Green: V
Blue: NV

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VLSS vs. LOFAR CS1



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Next steps

- Include other surveys
- Cas A & Cyg A
- Source detection
- Absolute flux calibration