

Low frequency observations of M101 and NGC 5775

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Overview

- 1 M101
- 2 NGC 5775
- 3 Facet Calibration/Imaging
- 4 Preliminary results



21cm map with WSRT

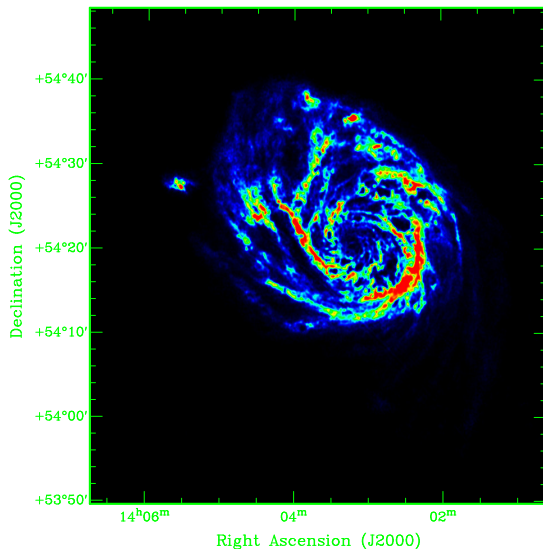


Image: Oosterloo et al (in prep)



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M101



Image: Star Trek (1966)



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21cm map with WSRT

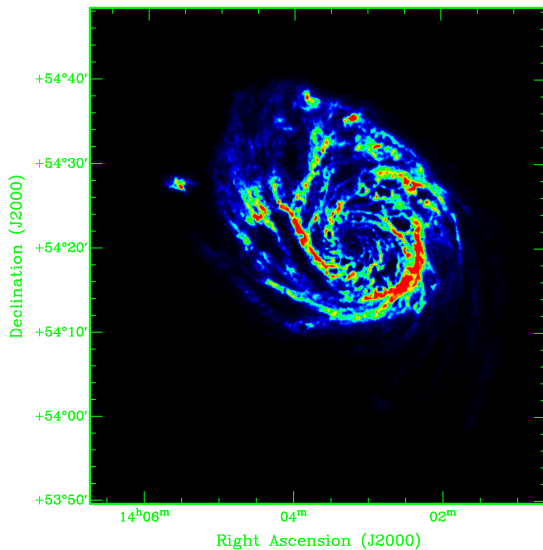


Image: Oosterloo et al (in prep)



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21cm map with WSRT



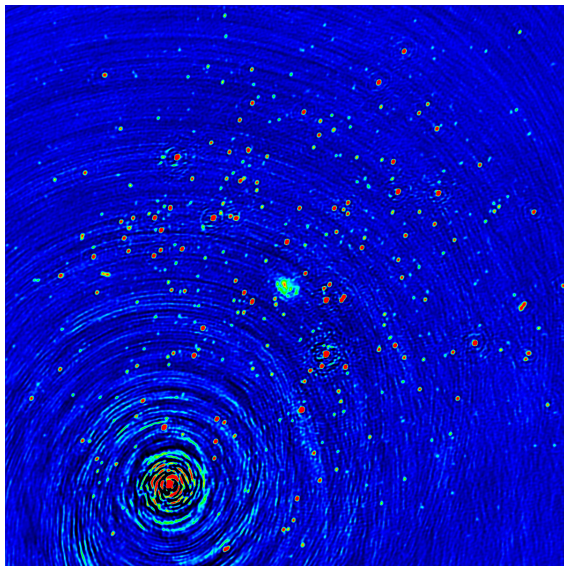
Image: Tom Oosterloo



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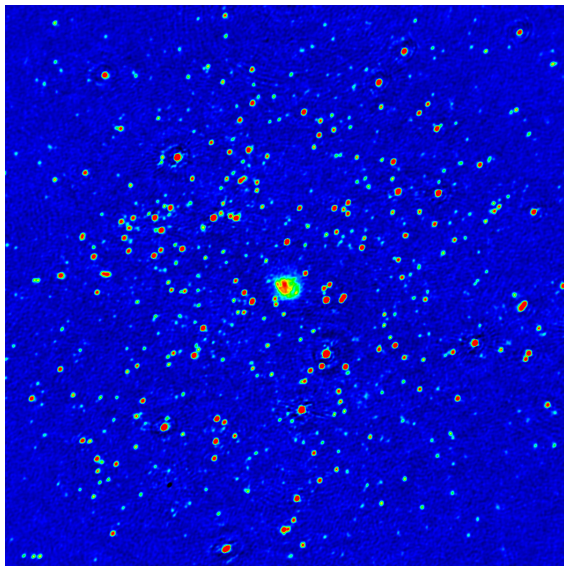
Lofar image of M101



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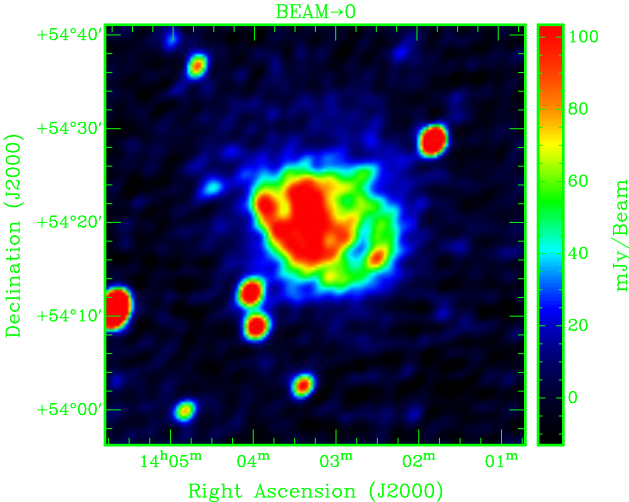
Peeling 3C295



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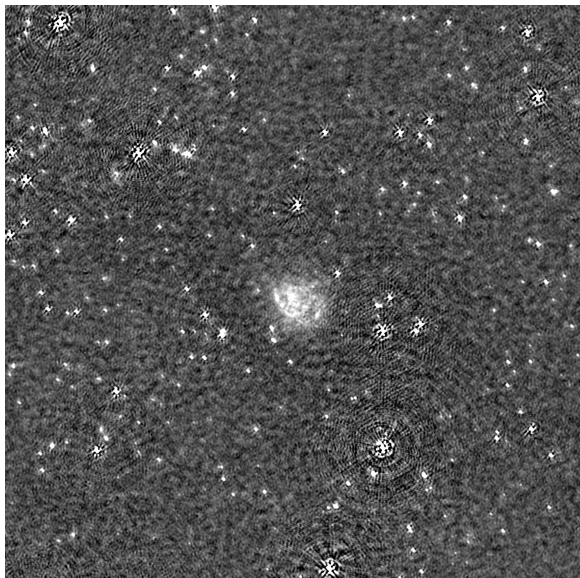
M101



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Artifacts at “higher” resolution

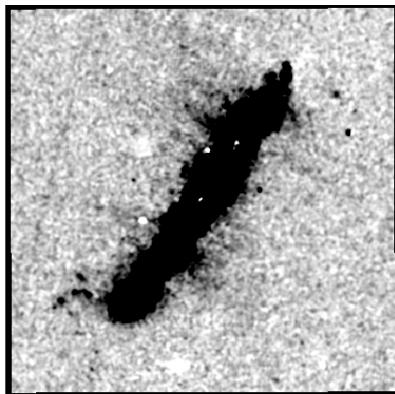


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NGC 5775

- Edge-on galaxy at ~ 25 Mpc
- 2×4 hour observations with LOFAR



Images: ESA/Hubble & NASA; Rich Rand



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NGC 5775

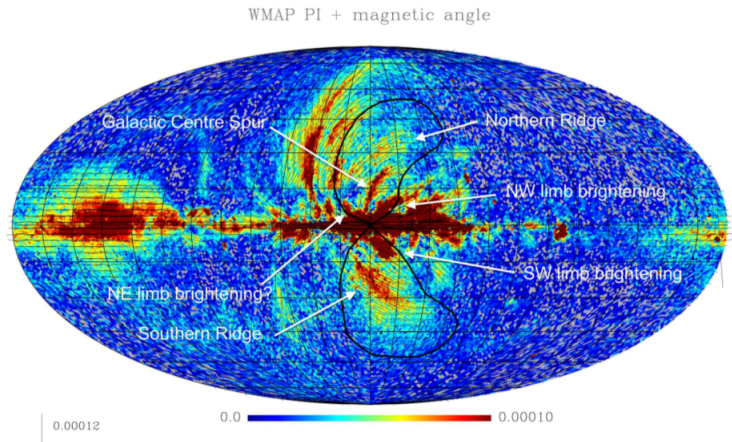


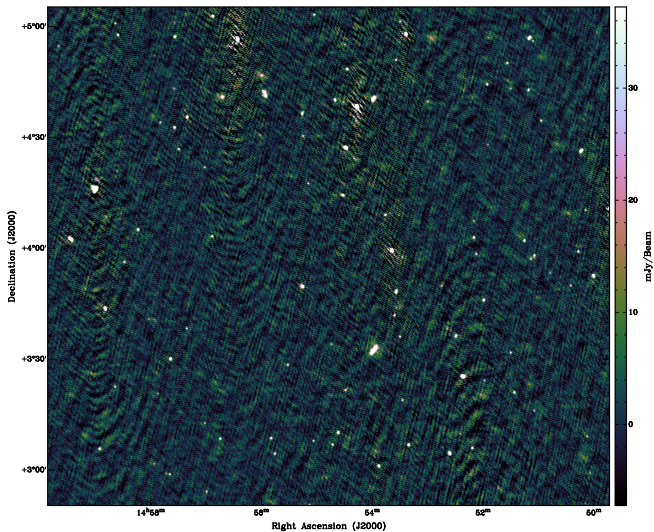
Image: Carretti et al (2013)



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NGC 5775

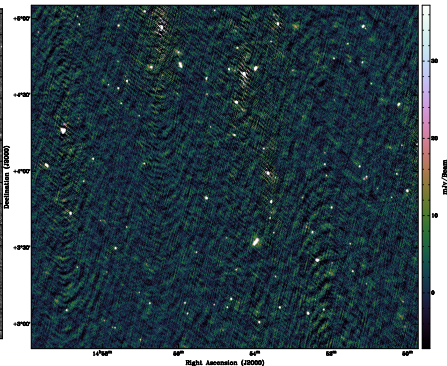
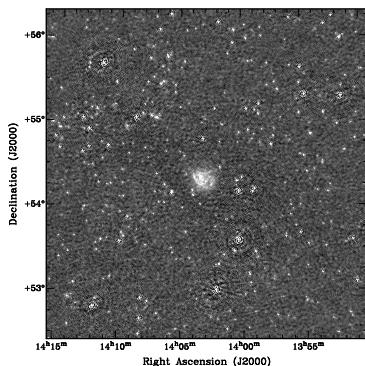


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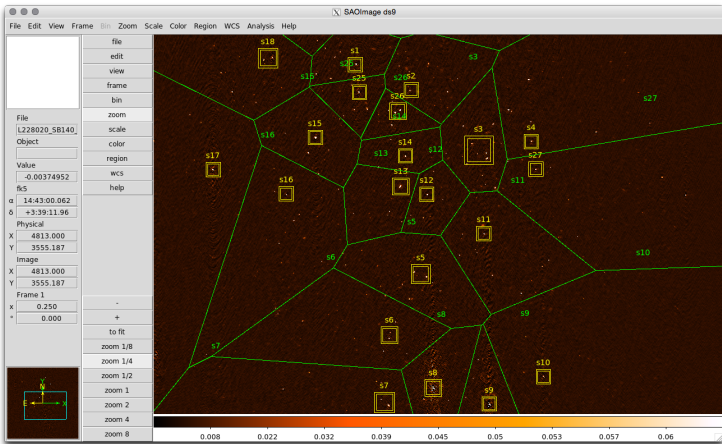
Why do we need facet calibration?

- Ionospheric effects are not constant within LOFAR's FOV
- Imperfect knowledge of station beam

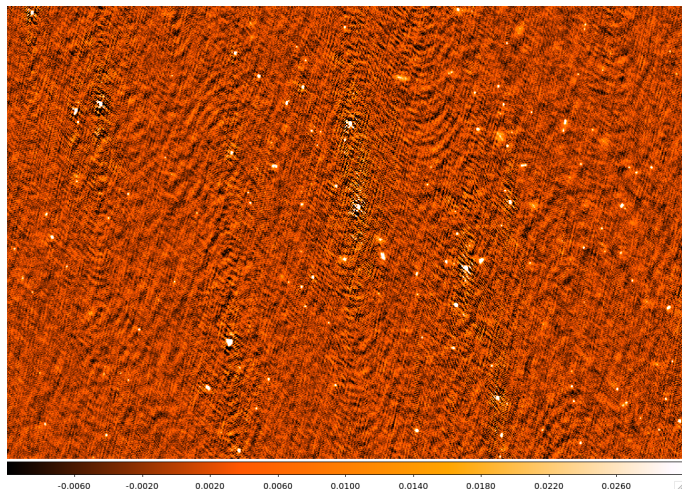


Facet Calibration

- See Wendy's (Feb 18, 2015) and George's (May 13, 2015) LSM talks
- Divide up the sky into multiple facets



Preliminary Images: 5775 (Old)



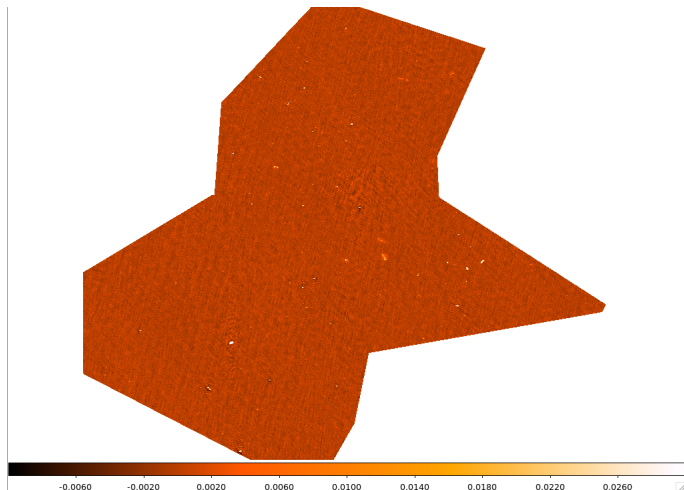
Noise: ~ 4 mJy/beam



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Preliminary Images: 5775 (New)

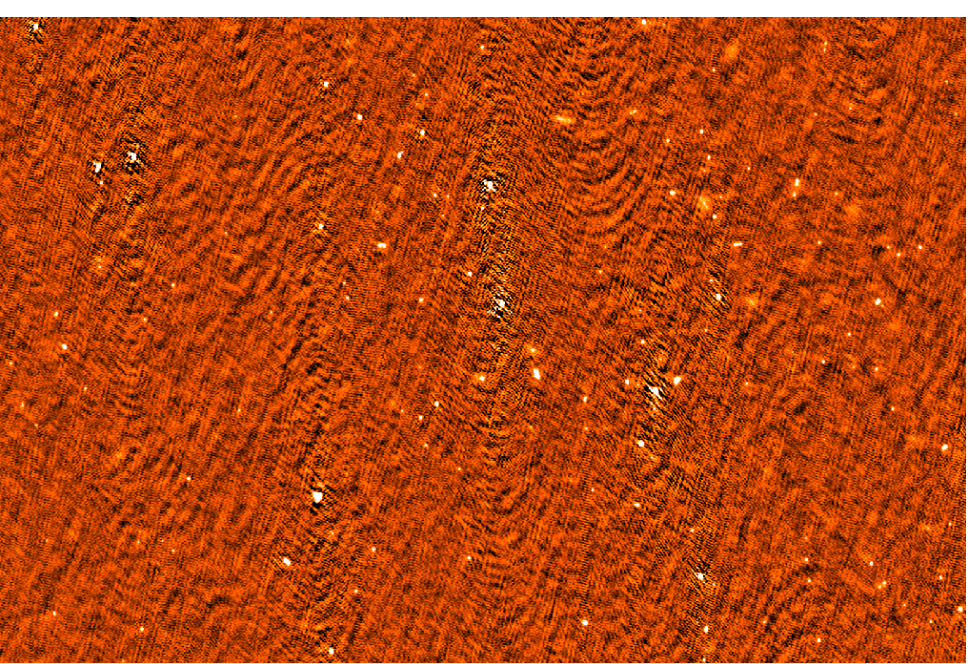


Noise: ~ 1.2 mJy/beam



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-0.0060

-0.0020

0.0020

0.0060

0.0100

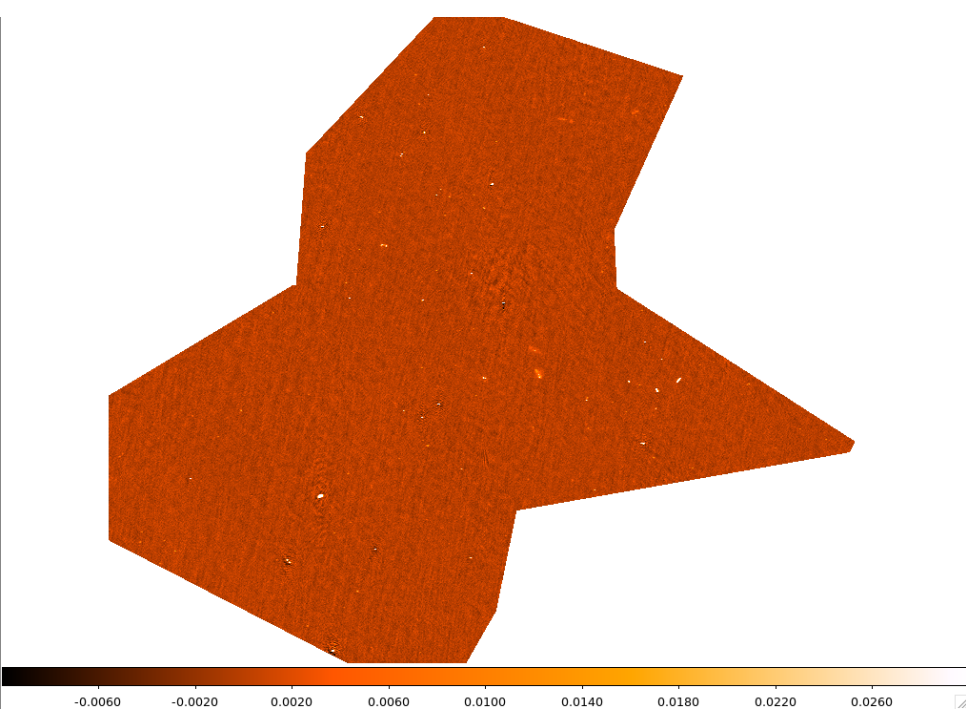
0.0140

0.0180

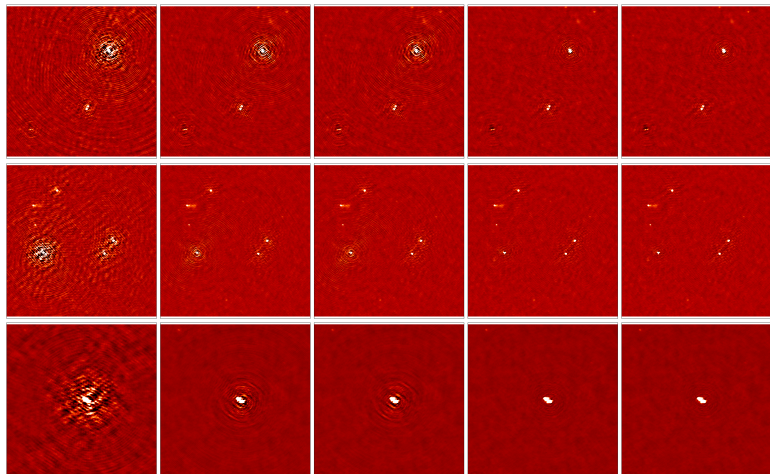
0.0220

0.0260





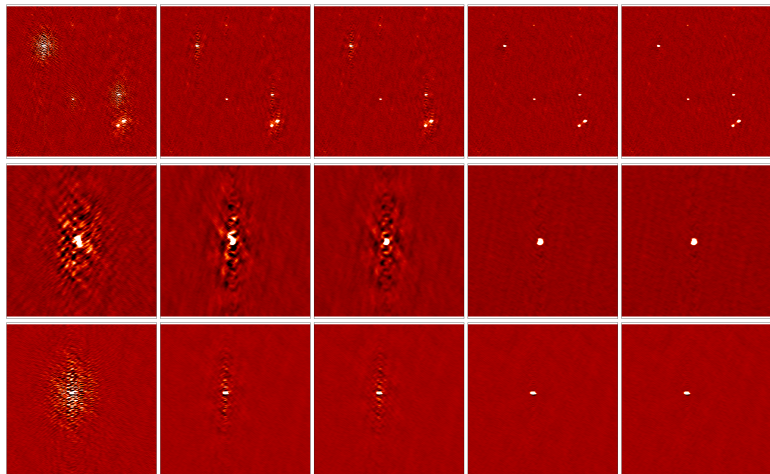
Individual sources (1/2)



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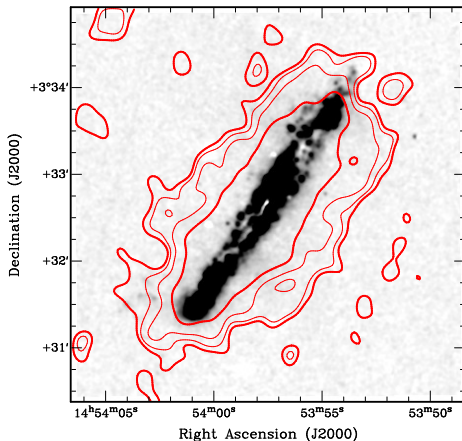
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Individual sources (2/2)



NGC 5775

- Data: 4 hours and 50 sub bands (1/12th of the entire dataset)
- Contours: 2, 3, 5 and 10 σ



H α Image: Rich Rand

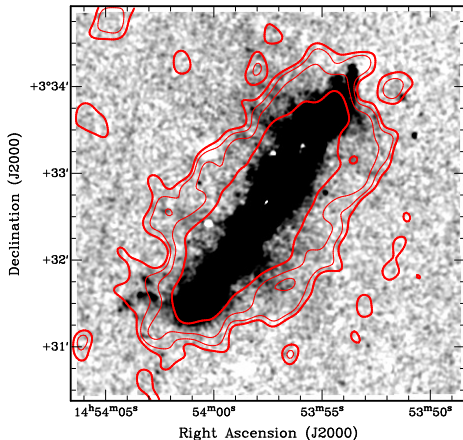


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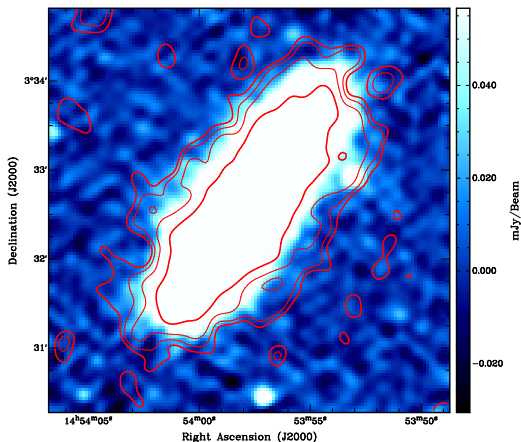


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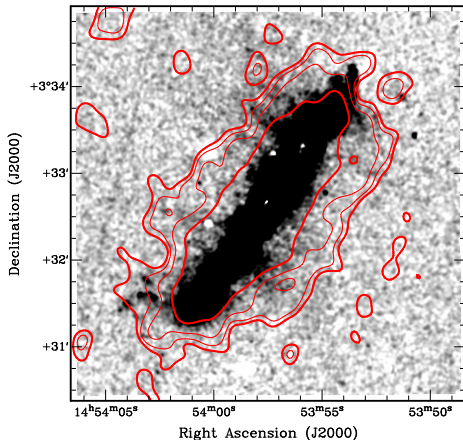
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