



Publication Year	2018
Acceptance in OA	2022-07-14T14:20:38Z
Title	VizieR Online Data Catalog: Bootes field deep LOFAR 150MHz imaging (Retana-Montenegro+, 2018)
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Publisher's version (DOI)	10.26093/cds/vizie.36200074
Handle	http://hdl.handle.net/20.500.12386/32491
Journal	VizieR Online Data Catalog



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J/A+A/620/A74 Bootes field deep LOFAR 150MHz imaging (Retana-Montenegro+, 2018)

Deep LOFAR 150 MHz imaging of the Bootes field:

Unveiling the faint low-frequency sky.

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<Astron. Astrophys. 620, A74 (2018)>

=2018A&A...620A..74R (SIMBAD/NED BibCode)

ADC_Keywords: Surveys ; Galaxies, radio ; Radio continuum

Keywords: surveys - catalogs - radio continuum: general -
techniques: image processing

Abstract:

We have conducted a deep survey (with a central rms of 55uJy) with the LOw Frequency ARray (LOFAR) at 120-168MHz of the Bootes field, with an angular resolution of 3.98"x6.45", and obtained a sample of 10091 radio sources (5σ limit) over an area of 20deg². The astrometry and flux scale accuracy of our source catalog is investigated. The resolution bias, incompleteness and other systematic effects that could affect our source counts are discussed and accounted for. The derived 150MHz source counts present a flattening below sub-mJy flux densities, that is in agreement with previous results from high- and low- frequency surveys. This flattening has been argued to be due to an increasing contribution of star-forming galaxies and faint active galactic nuclei. Additionally, we use our observations to evaluate the contribution of cosmic variance to the scatter in source counts measurements. The latter is achieved by dividing our Bootes mosaic into 10 non-overlapping circular sectors, each one with an approximate area of 2deg². The counts in each sector are computed in the same way as done for the entire mosaic. By comparing the induced scatter with that of counts obtained from depth observations scaled to 150MHz, we find that the 1σ scatter due to cosmic variance is larger than the Poissonian errors of the source counts, and it may explain the dispersion from previously reported depth source counts at flux densities $S < 1\text{mJy}$. This work demonstrates the feasibility of achieving deep radio imaging at low-frequencies with LOFAR.

Description:

The LOFAR mosaic image of the Bootes field and its corresponding source catalog are presented here. The mosaic image is obtained using 55 hours of observations, and it has a central rms noise of 0.255mJy/beam and an angular resolution of 3.98"x6.45".

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table2.dat	117	10091	LOFAR source catalog
list.dat	117	1	Information on fits image
fits/*	0	1	Fits image

See also:

- [J/AJ/123/1784](#) : 1.4GHz imaging of the Bootes field (de Vries+, 2002)
- [J/AJ/127/213](#) : LALA Bootes field X-ray source catalog (Wang+, 2004)
- [J/AJ/130/923](#) : Faint radio sources in the NOAO Bootes field (Wrobel+, 2005)
- [J/ApJ/634/L1](#) : 16um sources in the NOAO Bootes field (Kasliwal+, 2005)
- [J/ApJS/161/9](#) : X-ray survey of the NDWFS Bootes field (Kenter+, 2005)
- [J/ApJ/641/140](#) : Optical counterparts in the NDWFS Bootes field (Brand+ 2006)
- [J/A+A/535/A38](#) : Observations of NOAO Bootes field at 153MHz (Intema+, 2011)
- [J/ApJ/793/82](#) : LOFAR Bootes and 3C295 field sources (van Weeren+, 2014)
- [J/MNRAS/450/1477](#) : VLA 352MHz image of the Bootes field. I. (Coppejans+, 2015)
- [J/ApJ/817/119](#) : Bootes field Spitzer/IRAC variability survey (Kozlowski+, 2016)
- [J/MNRAS/460/2385](#) : Bootes field LOFAR 150-MHz observations (Williams+, 2016)

Byte-by-byte Description of file: [table2.dat](#)

Bytes	Format	Units	Label	Explanations
1- 19	A19	---	SourceID	Source name (JHHMSS.ss+DDMMSS.s) (Source_ID)
21- 28	F8.4	deg	RAdeg	Right ascension (J2000) (RA)
30- 37	F8.4	deg	e_RAdeg	rms uncertainty on RAdeg (E_RA)
39- 45	F7.4	deg	DEdeg	Declination (J2000) (DEC)
47- 55	F9.4	deg	e_DEdeg	rms uncertainty on DEdeg (E_DEC)
57- 65	F9.4	mJy	Ftotal	Integrated source flux density at 150MHz (Ftotal)
67- 74	F8.4	mJy	e_Ftotal	rms uncertainty on Ftotal (e_Ftotal)
76- 84	F9.4	mJy/beam	Fpeak	Peak flux density at 150MHz
86- 93	F8.4	mJy/beam	e_Fpeak	rms uncertainty on Fpeak (e_Fpeak)
95-100	F6.4	---	Fsmear	Approximate correction factor to the peak

