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Authors	Williams, W. L., van Weeren, R. J., Rottgering, H. J. A., Best, P., Dijkema, T. J., De Gasperin, F., Hardcastle, M. J., Heald, G., PRANDONI, ISABELLA, Sabater, J., Shimwell, T. W., Tasse, C., van Bemmell, I. M., Bruggen, M., BRUNETTI, GIANFRANCO, Conway, J. E., Ensslin, T., Engels, D., Falcke, H., Ferrari, C., Haverkorn, M., Jackson, N., Jarvis, M. J., Kapinska, A. D., Mahony, E. K., Miley, G. K., Morabito, L. K., Morganti, R., Orru, E., Retana-Montenegro, E., Sridhar, S. S., Toribio, M. C., White, G. J., Wise, M. W., Zwart, J. T. L.
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J/MNRAS/460/2385 Bootes field LOFAR 150-MHz observations (Williams+, 2016)

LOFAR 150-MHz observations of the Bootes field: catalogue and source counts.
 Williams W.L., van Weeren R.J., Rottgering H.J.A., Best P., Dijkema T.J.,
 de Gasperin F., Hardcastle M.J., Heald G., Prandoni I., Sabater J.,
 Shimwell T.W., Tasse C., van Bemmell I.M., Bruggen M., Brunetti G.,
 Conway J.E., Ensslin T., Engels D., Falcke H., Ferrari C., Haverkorn M.,
 Jackson N., Jarvis M.J., Kapinska A.D., Mahony E.K., Miley G.K.,
 Morabito L.K., Morganti R., Orru E., Retana-Montenegro E., Sridhar S.S.,
 Toribio M.C., White G.J., Wise M.W., Zwart J.T.L.
 <Mon. Not. R. Astron. Soc., 460, 2385–2412 (2016)>
 =[2016MNRAS.460.2385W](#) (SIMBAD/NED BibCode)

ADC_Keywords: Surveys ; Galaxies, radio ; Radio continuum

Keywords: techniques: interferometric - surveys - galaxies: active -
radio continuum: galaxies**Abstract:**

We present the first wide area (19 deg²), deep (~120-150 μJy/beam), high-resolution (5.6x7.4-arcsec) LOFAR High Band Antenna image of the Bootes field made at 130-169MHz. This image is at least an order of magnitude deeper and 3-5 times higher in angular resolution than previously achieved for this field at low frequencies. The observations and data reduction, which includes full direction-dependent calibration, are described here. We present a radio source catalogue containing 6276 sources detected over an area of 19deg², with a peak flux density threshold of 5σ. As the first thorough test of the facet calibration strategy, introduced by van Weeren et al. ([2016ApJS..223...2V](#)), we investigate the flux and positional accuracy of the catalogue. We present differential source counts that reach an order of magnitude deeper in flux density than previously achieved at these low frequencies, and show flattening at 150-MHz flux densities below 10 mJy associated with the rise of the low flux density star-forming galaxies and radio-quiet AGN.

Description:

Here, we report on the first LOFAR Cycle 2 High Band Antenna (HBA) observations of the Bootes field. The Bootes field is one of the Tier-3 Survey fields, and the aim is to eventually survey this field to the extreme rms depth of 12μJy/beam (1σ) at 150MHz.

The Bootes field was observed on 2014 August 10 with the LOFAR HBA stations.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table2.dat	108	6276	LOFAR 150-MHz source catalogue
table2.fits	2880	250	Fits version of table 2

See also:

- [J/AJ/123/1784](#) : 1.4 GHz 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](#) : 16μm 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 NDWFS Bootes field (Brand+, 2006)
- [J/A+A/535/A38](#) : Observations of NOAO Bootes field at 153MHz (Intema+, 2011)
- [J/ApJ/772/26](#) : AGN with WISE. II. The NDWFS Bootes field (Assef+, 2013)
- [J/A+A/549/A55](#) : GMRT 153MHz (2m) Radio Mini Survey I. (Williams+, 2013)
- [J/MNRAS/450/1477](#) : VLA 352MHz image of the Bootes field. I. (Coppejans+, 2015)
- [J/ApJ/817/119](#) : Spitzer/IRAC variability survey of Bootes field (Kozlowski+, 2016)
-
- [J/ApJ/793/82](#) : LOFAR Bootes and 3C295 field sources (van Weeren+, 2014)

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

Bytes	Format	Units	Label	Explanations
1- 19	A19	---	Name	LOFAR name (JHHMMSS.ss+DDMMSS.s) (LOFAR_name)
21- 29	F9.5	deg	RAdeg	Flux-weighted right ascension (J2000) (RA)
31- 37	F7.5	deg	e_RAdeg	rms uncertainty on RAdeg (E_RA)
39- 47	F9.5	deg	DEdeg	Flux-weighted declination (J2000) (DEC)
49- 55	F7.5	deg	e_DEdeg	rms uncertainty on DEdeg (E_DEC)
57- 63	F7.2	mJy	Sint	Integrated source flux density at 150MHz (Total_flux)
65- 69	F5.2	mJy	e_Sint	rms uncertainty on Sint (E_Totalflux)
71- 77	F7.2	mJy/beam	Fpeak	Peak flux density at 150MHz (Peak_flux)
79- 83	F5.2	mJy/beam	e_Fpeak	rms uncertainty on Fpeak (E_Peakflux)
85- 88	F4.2	---	Fsmear	Approximate correction factor to the peak

					flux density to account for bandwidth- and time-smearing (Fsmear)
90-	93	F4.2	mJy/beam	rms	Local rms noise used for the source detection (rms)
95-	96	I2	---	Ngauss	Number of Gaussian components (Ngauss)
	98	I1	---	Resolved	[0/1] flag indicating the resolved parametrization of the source (Flag_resolved) (1)
	100	I1	---	Badfit	[0/1] a bad Gaussian fit and so no parameters derived from the Gaussian fit (Flag_badfit)
	102	I1	---	Edge	[0/1] a source on the edge of the mosaic such that some of the flux is missing (Flag_edge)
	104	I1	---	Bad	[0/1] a source has been successfully fit with Gaussians but visual inspection indicates a likely poor fit or other problem (Flag_bad)
	106	I1	---	Artefact	[0/2] a source is identified as an artefact (Flag_artefact) (2)
	108	I1	---	Merged	[0/1] a large source whose source components have been manually merged into single sources (Flag_merged)

Note (1): flag indicating the resolved parametrization of the source as follows:

0 = unresolved sources
1 = resolved sources

Note (2): artefact flag as follows:

0 = no artefact
1 = a likely artefact
2 = an almost certain artefact

History:

From electronic version of the journal

(End)

Patricia Vannier [CDS] 15-Nov-2017

The document above follows the rules of the [Standard Description for Astronomical Catalogues](#); from this documentation it is possible to generate *f77* program to load files [into arrays](#) or [line by line](#).

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