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[J/A+A/613/A58](#)

Polarized point sources in LOTSS-HETDEX

(Van Eck+, 2018)

Polarized point sources in the LOFAR Two-meter Sky Survey:

A preliminary catalog.

Van Eck C.L., Haverkorn M., Alves M.I.R., Beck R., Best P., Carretti E., Chyzy K.T., Farnes J.S., Ferriere K., Hardcastle M.J., Heald G., Horellou C., Iacobelli M., Jelic V., Mulcahy D.D., O'Sullivan S.P., Polderman I.M., Reich W., Riseley C.J., Rottgering H., Schnitzler D.H.F.M., Shimwell T.W., Vacca V., Vink J., White G.J.
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 =[2018A&A...613A..58V](#) (SIMBAD/NED BibCode)

ADC Keywords: Polarization ; Radio sources

Keywords: Polarization ; Radio sources ; ISM: magnetic fields

Abstract:

We have produced a catalog of 92 polarized radio sources at 150MHz at 4.3-arcmin resolution and 1mJy rms sensitivity, which is the largest catalog of polarized sources at such low frequencies. The data used was from the LOFAR Two-Meter Sky Survey (LOTSS) initial release (Shimwell et al., 2017, Cat. [J/A+A/598/A104](#)), (10h45m-15h30m right ascension, 45-57° declination, 570 square degrees).

Description:

Visibility data taken from LOTSS, imaged in polarization, and had RM synthesis applied. Resulting RM spectra were searched for polarization peaks. Detected peaks that were determined to not be foreground or instrumental effects were collected in this catalog. Source locations (for peak searches) were selected from TGSS-ADR1 ([J/A+A/598/A78](#)).

Due to overlap between fields, some sources were detected multiple times, as recorded in the Ndet column.

Polarized sources were cross-matched with the high-resolution LOTSS images (Shimwell+, in prep), and WISE and PanSTARRS images, which were used to determine the source classification and morphology.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
lotss-rm.dat	179	92	Catalog of polarized point sources

See also:

[J/ApJ/702/1230](#) : Rotation measure image of the sky (Taylor+, 2009)
[J/A+A/598/A78](#) : The GMRT 150MHz all-sky radio survey (Intema+, 2017)
[J/A+A/598/A104](#) : LOFAR Two-metre Sky Survey (Shimwell+, 2017)

Byte-by-byte Description of file: lotss-rm.dat

Bytes	Format	Units	Label	Explanations
2- 3	I2	---	CatID	Catalog identification number (sole pulsar, J1115+5030, is #99) (1)
6- 21	A16	---	TGSS	ID Source name in TGSS-ADR1 catalog (Intema et al., 2007, J/A+A/598/A78) (JHHMSS.s+DDMMSS)
23- 24	I2	h	RAh	Right Ascension (J2000)
26- 27	I2	min	RAm	Right Ascension (J2000)
29- 32	F4.1	s	RA s	Right Ascension (J2000)
34- 36	F3.1	s	e_RAs	Error in right ascension
38	A1	---	DE-	Declination sign (J2000)
39- 40	I2	deg	DEd	Declination (J2000)
42- 43	I2	arcmin	DEm	Declination (J2000)
45- 48	F4.1	arcsec	DEs	Declination (J2000)
50- 53	F4.1	arcsec	e_DEs	Error in declination
55	I1	---	Ndet	Number of independent detections
57- 61	F5.2	mJy	PolInt	Peak polarized intensity (in mJy/PSF unit)
63- 66	F4.2	mJy	e_PolInt	Error in peak polarized intensity (in mJy/PSF unit)
69- 73	F5.2	rad/m2	Phi	Faraday depth of peak polarized intensity
75- 78	F4.2	rad/m2	e_Phi	Error in Faraday depth
80- 84	F5.2	%	m	Polarization fraction (of Stokes I)
86- 89	F4.2	%	e_m	Error in polarization fraction
91- 95	F5.1	rad/m2	NVSS-RM	?=0 Rotation measure from Taylor et al. (2009, J/ApJ/702/1230) (2)
97-100	F4.1	rad/m2	e_NVSS-RM	?=0 Error in Taylor et al. (2009, J/ApJ/702/1230) rotation measure (2)
102-106	F5.2	%	NVSS-m	?=0 Polarization fraction from Taylor et al. (2009, J/ApJ/702/1230) (2)
108-111	F4.2	%	e_NVSS-m	?=0 Error in Taylor et al. (2009, J/ApJ/702/1230) polarization fraction (2)
113-136	A24	---	Type	Source Stokes I morphology
138	A1	---	LOFAR?	[Y/N] Counterpart in high-resolution LOTSS?
142-143	A2	---	Optical?	[YN?] Optical counterpart identified?
146-179	A34	---	Comments	Comments on morphology, optical ID

Note (1): Single polarized pulsar is given CatID #99 to distinguish from
rest of catalog.

Note (2): Sources without counterparts in Taylor et al. (2009, Cat.
[J/ApJ/702/1230](#)) catalog have zero values for corresponding columns.

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Cameron Van Eck, [cameronve\(at\)gmail.com](mailto:cameronve(at)gmail.com)

(End)

Patricia Vannier [CDS]

12-Jun-2018

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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