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J/MNRAS/436/3557 HTRU survey: long-period pulsars polarimetry (Tiburzi+, 2013)

The High Time Resolution Universe survey.

IX. Polarimetry of long-period pulsars.

Tiburzi C., Johnston S., Bailes M., Bates S.D., Bhat N.D.R., Burgay M.,
Burke-Spolaor S., Champion D., Coster P., D'Amico N., Keith M.J.,
Kramer M., Levin L., Milia S., Ng C., Possenti A., Stappers B.W.,
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=[2013MNRAS.436.3557T](#) (SIMBAD/NED BibCode)

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Abstract:

We present a polarimetric analysis of 49 long-period pulsars discovered as part of the High Time Resolution Universe (HTRU) southern survey. The sources exhibit the typical characteristics of 'old' pulsars, with low fractional linear and circular polarization and narrow, multi-component profiles. Although the position angle swings are generally complex, for two of the analysed pulsars (J1622-3751 and J1710-2616) we obtained an indication of the geometry via the rotating vector model. We were able to determine a value of the rotation measure (RM) for 34 of the sources which, when combined with their dispersion measures (DM), yields an integrated magnetic field strength along the line of sight. With the data presented here, the total number of values of RM associated with pulsars discovered during the HTRU southern survey sums to 51. The RMs are not consistent with the hypothesis of a counter-clockwise direction of the Galactic magnetic field within an annulus included between 4 and 6kpc from the Galactic Centre. A partial agreement with a counter-clockwise sense of the Galactic magnetic field within the spiral arms is, however, found in the area of the Carina-Sagittarius arm.

Description:

We present the polarization analysis of a sample of 49 long-period pulsars, whose spin periods range from a few hundred milliseconds to about two and a half seconds. They were all discovered during the mid-latitude part of the HTRU survey (Keith et al. [2010MNRAS.409..619K](#); Bates et al. [2012MNRAS.427.1052B](#)) apart from PSR J1846-4249 (that has been discovered in the high latitude survey and it will be presented in one of the next papers of the HTRU series).

After discovery and confirmation, the pulsars were followed-up with the third Parkes Digital Filterbank, observing them for at least one year to allow the determination of a complete timing solution.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table1.dat	102	34	Pulsars for which RM can be determined
table2.dat	102	15	Pulsars for which no RM can be determined

See also:

[J/MNRAS/423/1351](#) : Energy distribution in pulsars (Burke-Spolaor+, 2012)
[J/MNRAS/450/2922](#) : HTRU survey new pulsars (Ng+, 2015)

Byte-by-byte Description of file: [table1.dat](#) [table2.dat](#)

Bytes	Format	Units	Label	Explanations
1- 10	A10	---	Name	Name (JHHMM+DDMM)
12- 16	F5.3	s	P	Spin period
18- 20	I3	ms	W10	Profile width at 10 per cent
22- 24	I3	ms	W50	Profile width at 50 per cent
26- 29	F4.1	[-]	LogdE/dt	Logarithm of the spin-down luminosity
31- 34	F4.2	mJy	S0	Total intensity flux
36- 38	F3.2	mJy	e_S0	rms uncertainty on S0 (3sigma)
40- 43	F4.1	%	L	Percentage of the linear polarisation
45- 47	F3.1	%	e_L	rms uncertainty on L (1sigma)
49- 52	F4.1	%	V	Percentage of the circular polarisation
54- 56	F3.1	%	e_V	rms uncertainty on V (1sigma)

58- 61	F4.1	%	V	Absolute value of percentage of the circular polarisation
63- 65	F3.1	%	e_ V	rms uncertainty on V (1sigma)
67- 70	I4	rad/m2	RM	?=- Rotation measure
72- 73	I2	rad/m2	e_RM	?=- rms uncertainty on RM (1sigma)
75- 80	F6.2	pc/cm3	DM	Dispersion measure (decimal values for corrected values from erratum) (2) .
81- 84	F4.2	pc/cm3	e_DM	? rms uncertainty on DM for corrected values from erratum (2) .
86- 89	F4.2	kpc	Dist	? DM derived distance (1) .
91- 96	F6.3	ugauss		?=- Average value of the magnetic field along the line of sight
98-100	F3.1	[-]	logtauC	logarithm of the characteristic age
102	A1	---	Corr	[*] * for corrected values (2) .

Note (1): DM derived distance from the Sun (via the NE2001 electron density model from Cordes & Lazio (2002, preprint (astro-ph/020715), that gives uncertainties up to about 30 per cent).

Note (2): DM, RM, and <B||> updated from erratum (2014, MNRAS, 445, 3009).

History:

From electronic version of the journal

References:

- Keith et al., Paper I [2010MNRAS.409..619K](#)
 Bates et al., Paper II [2011MNRAS.416.2455B](#)
 Burke-Spolaor et al., Paper III [2011MNRAS.416.2465B](#)
 Keith et al., Paper IV [2012MNRAS.419.1752K](#)
 Burke-Spolaor et al., Paper V [2012MNRAS.423.1351B](#), Cat. [J/MNRAS/423/1351](#)
 Bates et al., Paper VI [2012MNRAS.427.1052B](#)
 Burgay et al., Paper VII [2013MNRAS.433..259B](#)
 Levin et al., Paper VIII [2013MNRAS.434.1387L](#)
 Barr et al., Paper IX [2013MNRAS.435.2234B](#)
 Ng et al., Paper X [2014MNRAS.439.1865N](#)
 Bates et al., Paper XI [2015MNRAS.446.4019B](#)
 Ng et al., Paper XII [2015MNRAS.450.2922N](#), Cat. [J/MNRAS/450/2922](#)

(End)

Patricia Vannier [CDS] 20-Nov-2017

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