OAG JUPITER PROJECT 2007+

THIRD REPORT

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TWO ANTICYCLONIC OVALS IN NNTZ, 2007

By Tòfol Tobal (1) & Josep A. Soldevilla (2)

1: Observatori Astronòmic del Garraf (Barcelona, Spain)

2: Observatori Astronòmic de Canyellas (Barcelona, Spain)

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OAG website: http/www.oagarraf.net / e-mail: informaciooag@gmail.com

1. Observations of two Anticyclonic Ovals in NNTZ (july-september 2007)

We study two Anticyclonic Ovals in Jupiter's northern hemisphere registered in Soldevilla (JAS) images, in the analysis of the observations obtained throughout the OAG_Jupiter Project 2007+

The first oval (CW1**)** was detected on July 13 between 22h45m UT and 23h30m UT, with an approximate diameter of about 6.000km crossing the CM. It was registered again with higher image quality on July 18 at 21h25m UT, presenting an axis in length of 6º and 4º in latitude. Its position was Long (II) = 294º and Lat = + 41º, being approximately 4.000km in diameter. It was followed by a smaller spot located at Long (II) = 297º and Lat = + 42º with a diameter close to 1.500km. In the best images details are seen inside the main spot, forming five condensations, with an upper albedo. A small spot on the preceding limit was also detected.

In addition to the JAS images, observations from the Jupiter_ALPO_Japan_2007 files obtained by Carvallo, Go and Parker between July 13 and September 23, 2007 have been used. With them, it was possible to determine their position drift and the rotation period. The observations indicate that the main spot was growing in length while the small satellite spot was incorporated into the main body. The diameter at the end of October was about 6,000km, a probable result of the merger and expansion of the three bodies. The resulting rotation period was 9h55m33seg. For example, the spacecraft Voyager also recorded a bright oval at + 41º with a drift of + 1º in 1979, consistent with this oval and belonging to N3TC (current). The calculated winds indicate a speed of 1.8m / s. Rogers (BAA/Jupiter Section) considers that they must belong to the NNTZ.

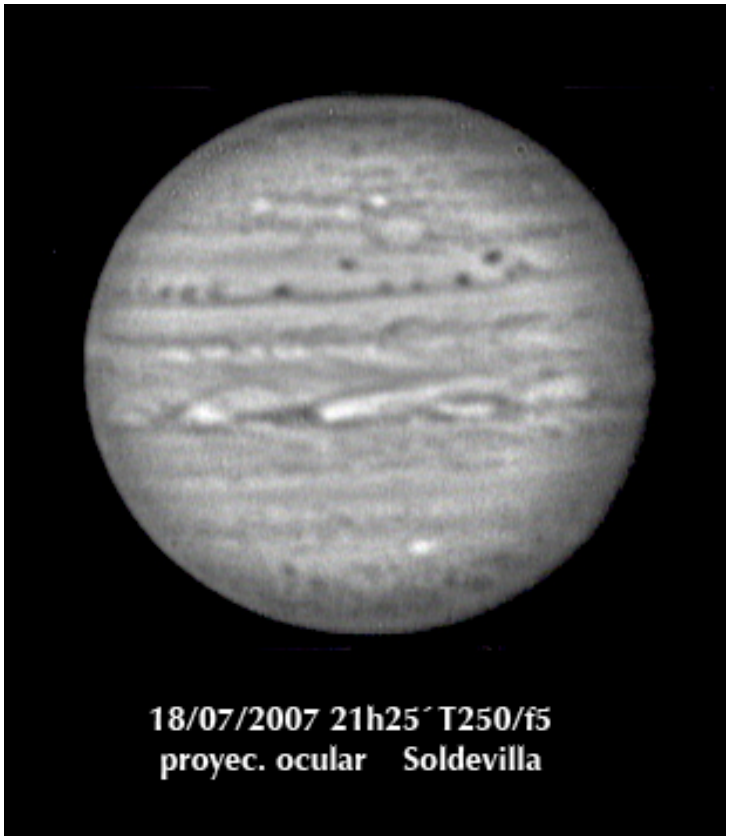


Fig.1 Image by J.A.Soldevilla. The three bodies of WC1 are appreciated (South up)

Fig.2 High resolution images by D.C.Parker (South up)

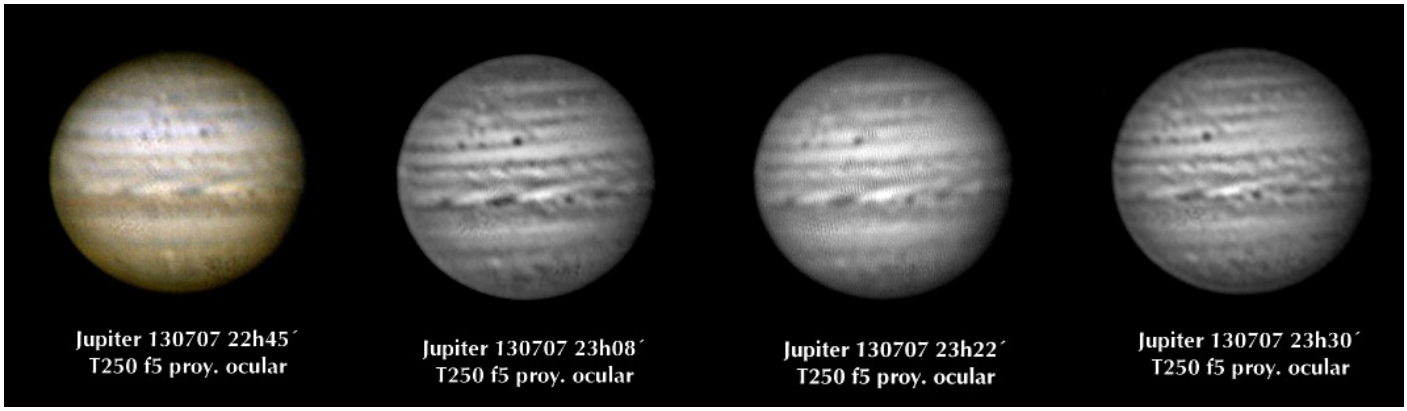


Fig.2 Images by J.A.Soldevilla. The oval CW1 is visible in North Hemisphere (South up)

Record	Object	R	Date	UT	L1	L2	L3	+/-	Sy.	PhA	B"	+/-	Meas.	Chan.
1	WC1_OVAL	U1	2007/07/13	02:46,2	57,4	**294,2**	187,2		2	-7,0	**+41,5**		TOB	**RGB**
2	WC1_OVAL	U1	2007/07/13	03:11,3	59,7	**296,4**	189,4		2	-7,0	**+40,9**		TOB	**RGB**
3	WC1_OVAL	U1	2007/07/13	22:45,0	65,6	**296,0**	189,3		2	-7,1	**+42,0**		TOB	**RGB**
4	WC1_OVAL	U1	2007/07/13	23:08,0	62,4	**292,8**	186,1		2	-7,1	**+42,9**		TOB	**R-IR**
5	WC1_OVAL	U1	2007/07/13	23:22,0	63,7	**293,9**	187,2		2	-7,1	**+42,5**		TOB	**R-IR**
6	WC1_OVAL	U1	2007/07/13	23:30,0	64,7	**295,0**	188,2		2	-7,1	**+41,5**		TOB	**R-IR**
7	WC1_OVAL	U1	2007/07/18	13:01,0	96,8	**292,2**	186,7		2	-7,8	**+41,8**		TOB	**RGB**
8	WC1_OVAL	U1	2007/07/18	21:25,0	101,8	**294,6**	189,1		2	-7,8	**+42,6**		TOB	**R-IR**
9	WC1_OVAL	U1	2007/07/20	13:31,0	114,5	**294,5**	189,5		2	-8,1	**+42,1**		TOB	**RGB**
10	WC1_OVAL	U1	2007/08/13	12:18,0	295,7	**293,0**	194,4		2	-10,4	**+42,5**		TOB	**RGB**
11	WC1_OVAL	U1	2007/08/28	10:34,0	42,7	**286,1**	191,5		2	-11,0	**+41,8**		TOB	**RGB**
12	WC1_OVAL	U1	2007/09/23	21:33,0	239,7	**281,3**	193,7		2	-10,5	**+40,7**		TOB	**RGB**

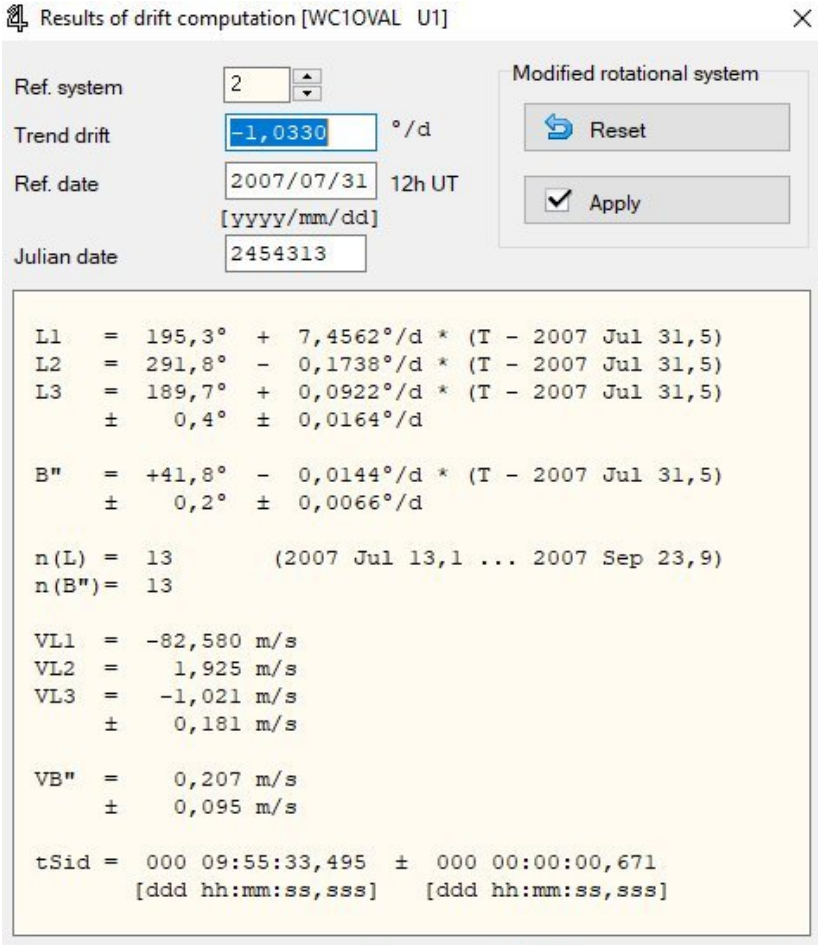


Fig.3 Measures and parameters of the WC1*. Winjupos application.

The second oval (CW2) was detected on July 14 on an image taken at 21h08m UT by JAS being approximately of about 2.700km diameter following the CM. Its position was Long (II) = 43º and Lat = + 41º. In a higher image quality by Kazanas (Melbourne) on August 24 at 10h08m UT, presenting an axis in length of 4º in longitude and 2º in latitude, wrapped in a dark halo, which extended extensively toward following limb, forming a belt stroke. Unlike the first spot, no changes were detected in its extension during the observations. Due to its small size, no internal details were detected with 250mm-400mm telescopes.

In addition to the JAS images, observations from the Jupiter_ALPO_Japan_2007 files obtained by Go, Heffner and Kazanas between July 09 and August 24, 2007 have been used. With them, it was possible to determine their position drift and the rotation period. The resulting rotation period was 9h55m28seg. The calculated winds indicate a speed of 3.2m / s. just like CW1 is located in the NNTZ.

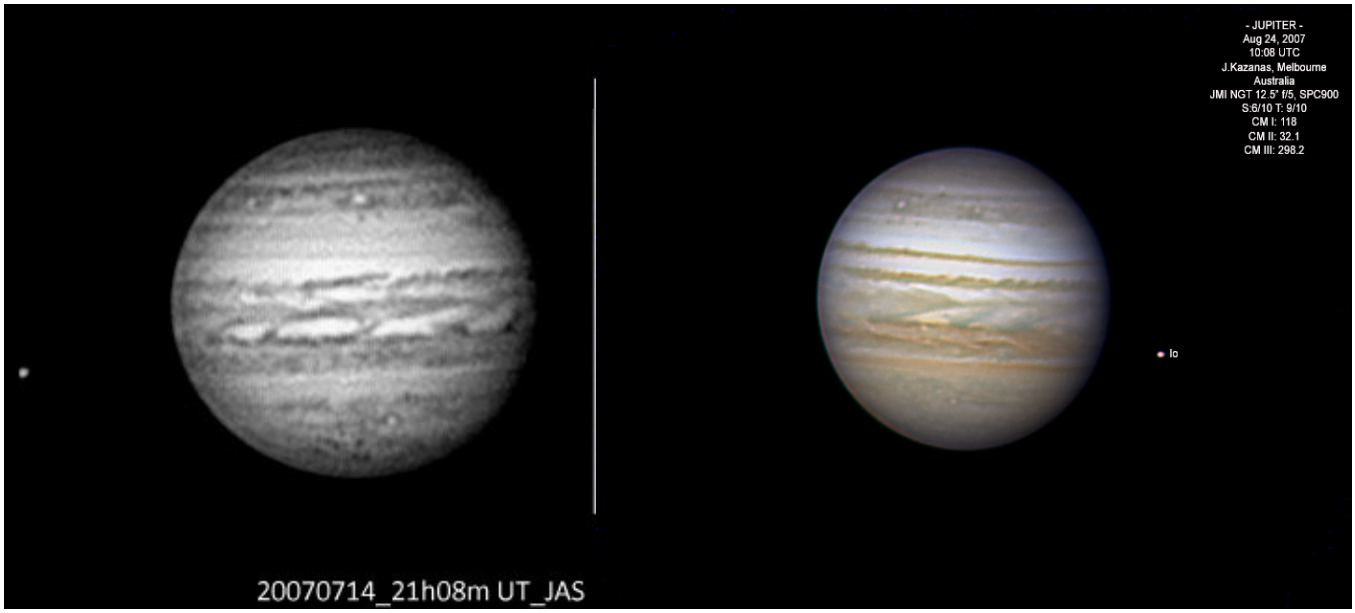


Fig.3 Images by Soldevilla and Kazanas . The WS (CW2) is visible in North Hemisphere (South up)

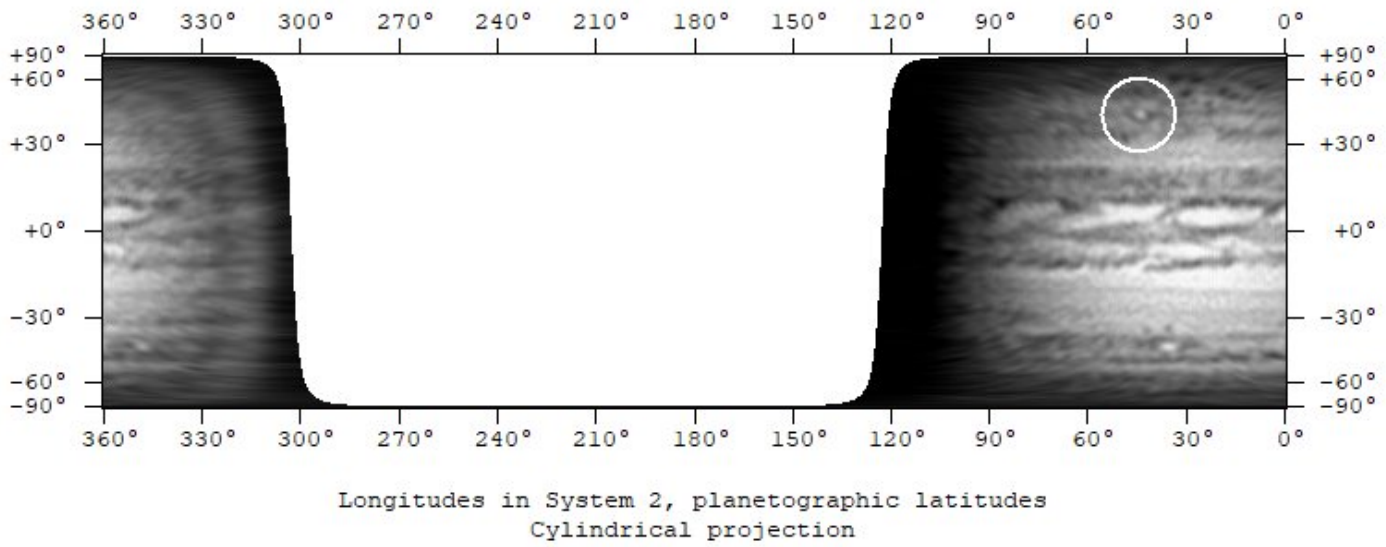


Fig.4 Position of WC2* from Soldevilla 20070714_21h08m UT image (North up)

Record	Object	R	Date	UT	L1	L2	L3	+/-	Sy.	PhA	B"	+/-	Meas.	Chan.
1	WC2_OVAL	U1	2007/07/09	12:16,0	136,2	**40,5**	292,6		2	-6,4	**+42,8**		TOB	RGB
2	WC2_OVAL	U1	2007/07/09	12:26,0	138,8	**43,1**	295,2		2	-6,4	**+42,1**		TOB	RGB
3	WC2_OVAL	U1	2007/07/09	12:46,0	138,8	**43,0**	295,1		2	-6,4	**+41,9**		TOB	RGB
4	WC2_OVAL	U1	2007/07/14	21:08,0	180,1	**43,5**	297,0		2	-7,3	**+41,7**		TOB	R-IR
5	WC2_OVAL	U1	2007/07/16	12:18,0	193,8	**44,7**	298,6		2	-7,5	**+41,5**		TOB	RGB
6	WC2_OVAL	U1	2007/07/16	21:46,0	198,8	**46,7**	300,7		2	-7,6	**+41,9**		TOB	RGB
7	WC2_OVAL	U1	2007/08/24	10:08,0	116,6	**30,6**	294,9		2	-10,9	**+41,5**		TOB	RGB
8	WC2_OVAL	U1	2007/08/24	10:14,0	116,1	**30,2**	294,5		2	-10,9	**+41,6**		TOB	RGB

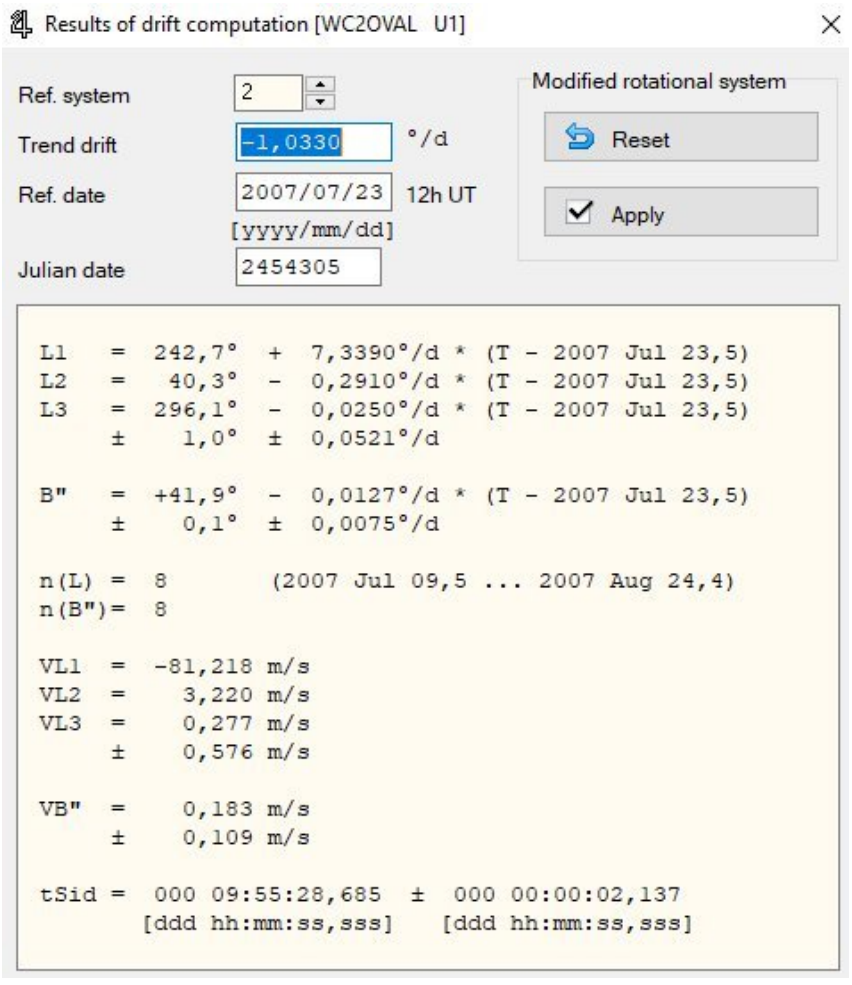
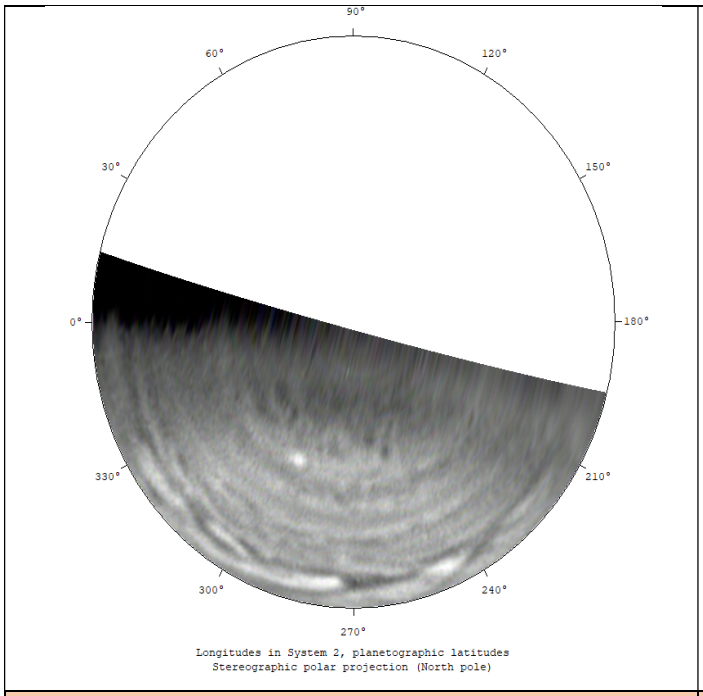
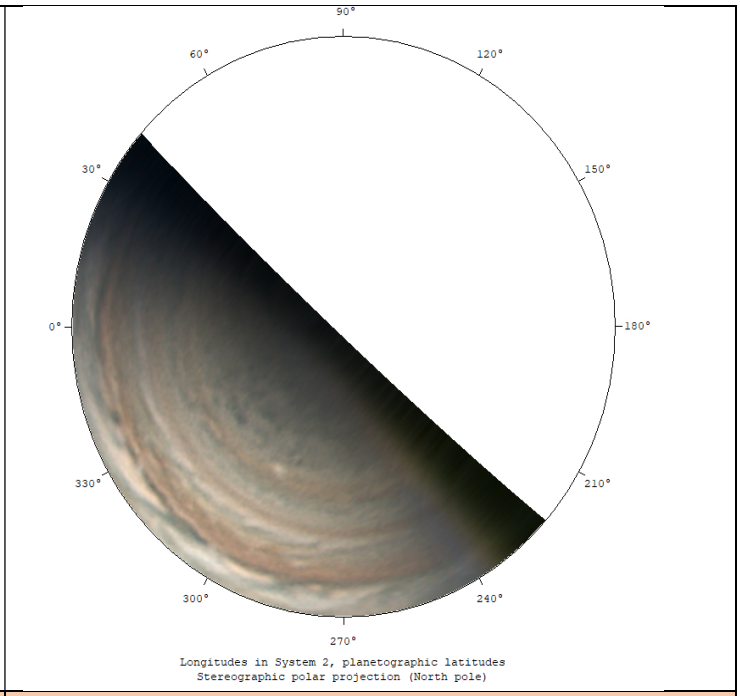


Fig.5 Measures and parameters of the WC2. Winjupos application.

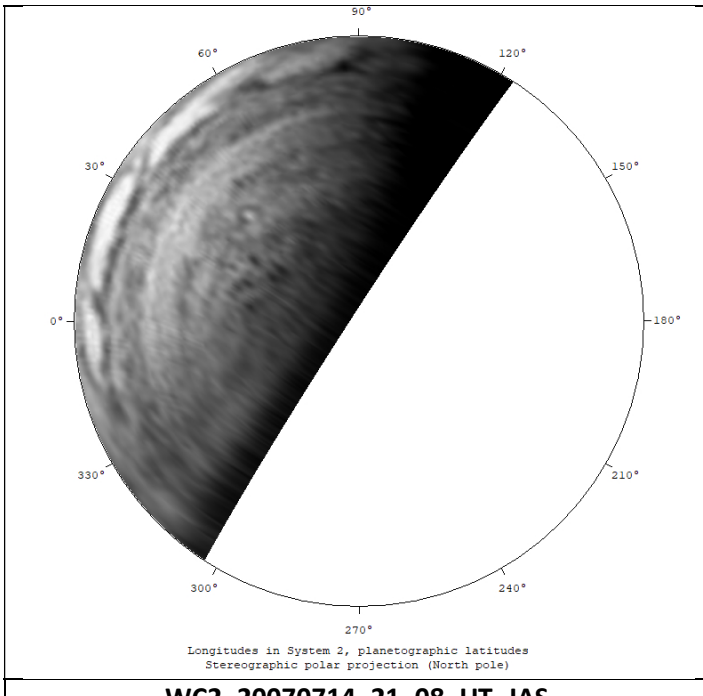
*Note: The CW1 and CW2 are Winjupos standard code, nor official nomenclature for Jupiter details.



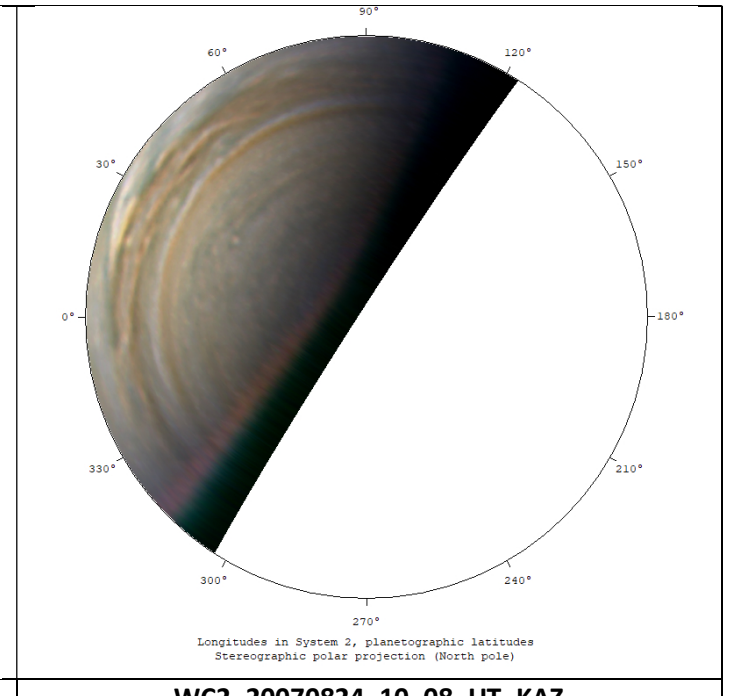
WC1_20070718_21_25_UT_JAS



WC1_20070718_03_11_UT_PAR_



WC2_20070714_21_08_UT_JAS



WC2_20070824_10_08_UT_KAZ

Fig 6 . Polar projections (North Hemisphere).Winjupos application.

APPENDIX I

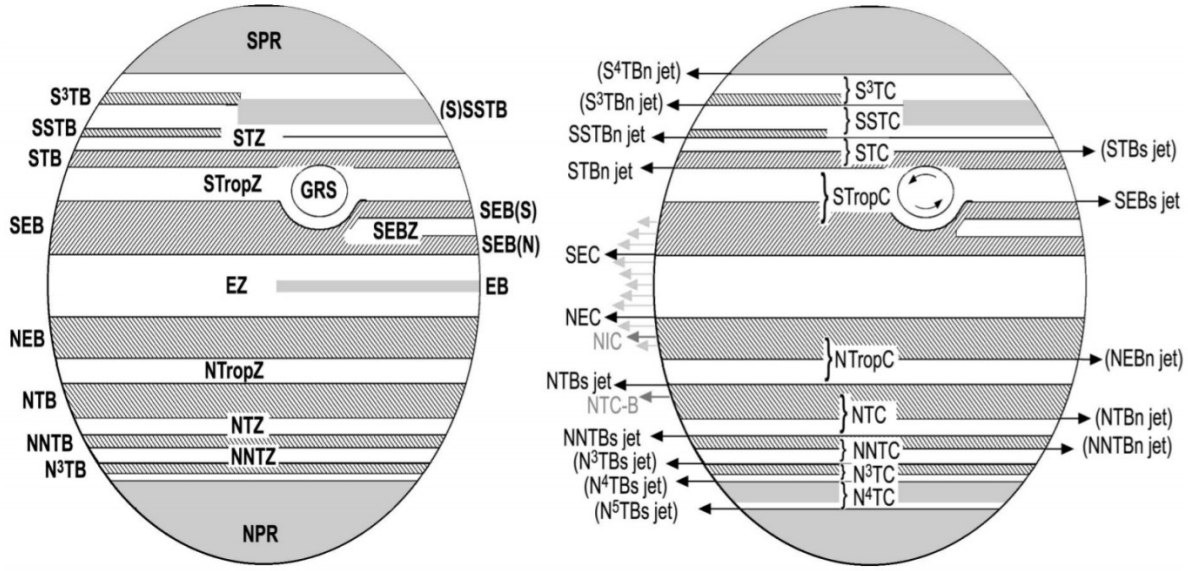


Fig.7 Belts, Zones and Currents in Jupiter (Rogers 1995)

APPENDIX II

Average Reference Positions of Jupiter Belts 1907-2018

Zenographic Latitudes (Tobal-Soldevilla 2019)

BELTS NH	ß”	σ st		BELTS SH	ß”	σ st
1907-2018	Average	Average		1907-2018	Average	Average
NPR/NPH	+65,0	1,20		EB-sn	-1,5	0,20
N5TB-n	+59,9	0,20		EB-sc	-3,0	0,25
N5TB-c	+57,1	0,35		EB-ss	-4,7	0,10
N5TB-s	+52,3	1,00		SEB-nn	-6,9	0,20
N4TB-n	ND	ND		SEB-nc	-7,8	0,30
N4TB-c	+50,9	0,20		SEB-ns	-8,6	0,55
N4TB-S	+48,2	0,50		SEB-n	-7,0	1,00
N3TB-n	+47,0	0,68		SEB-sn	-9,0	0,30
N3TB-c	+44,5	0,80		SEB-sc	-11,9	0,20
N3TB-s	+41,8	0,67		SEB-ss	-12,7	0,40
N2TB-n	+39,0	0,60		SEB-sn	-17,5	0,57
N2TB-s	+37,6	0,80		SEB-sc	-20,1	0,73
N2TB-s	+35,6	0,70		SEB-ss	-24,3	0,25
NTB-nn	+33,9	0,40		STB-n	-26,6	0,85
NTB-nc	+32,4	0,40		STB-c	-29,7	0,67
NTB-ns	+30,9	0,93		STB-s	-32,6	0,75
NTB	+28,6	0,60		S2TB-n	-36,2	0,63
NTB-sn	+25,8	0,55		S2TB-c	-39,0	0,65
NTB-sc	+24,3	0,83		S2TB-s	-41,7	1,28
NTB-ss	+22,2	0,70		S3TB-n	-43,7	0,73
NEB-n	+17,3	1,53		S3TB-c	-47,2	0,60
NEB-c	+12,6	0,40		S3TB-s	-48,7	0,90
NEB-s	+7,7	0,75		S4TB-c	-53,1	0,63
EB-nc	+1,5	0,10		S4TB-s	-57,2	0,60
				S5TB-n	-61,4	2,00
				S5TB-c	-65,1	0,50
				S5TB-s	ND	ND
				SPR/SPH	-68,2	1,20

n= nord, **c**= center, **s**= south, **H**=hood

REFERENCES:

Peek B.M,: The Planet Jupiter, 1958_Revised edition 1981: Faber & Faber. London.

Rogers J.H,: The Giant Planet Jupiter First edition 1995. Cambridge Univ.Press.

Rogers J.H et al,: 2017, Jupiter’s high northern latitudes: patterns and dynamics of the N3 to N6 domains. JUPOS & BAA.

Rogers J.H.: 2019, Private communications.

Tobal T. & Soldevilla J.A,: *OAG_Jupiter Second Report*, january 2019. Zenographic latitudes of Jupiter Belts. Part I: Reference Positions 1907 – 2018. Publications of Garraf Astronomical Observatory (Barcelona, Spain). http://www.oagarraf.net

Hahn, G.: WinJupos Software. Dresden (Germany). http://www.grischa-hahn.homepage.t-online.de/

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