Jupiter in 2021: Report no.5 The South Temperate domain in 2021 John Rogers (BAA) (2021 Dec.18)

Table & miniature Figures

Table 1:

South Temperate domain, 2021: Drifts & latitudes from JUPOS data					
<u>Feature</u>	<u>Dates</u>	<u>DL2</u>	<u>DL3</u>	<u>Lat.</u>	
		(deg/30d)	(deg/30d)	('graphic)	
F-Spectre	2020 Aug2021 Sep (mean)	-10.1	-2.1	(-30)	
	2021 July-Aug	-9.5	-1.5	(-30)	
Clyde's Spot	2020 Aug2021 Sep (mean)	-16.5	-8.5	-30.6	
(DS7)	2021 July-Aug	-16.5	-8.5	-30.6	
Dark spot d1	2021 July-Aug	-12.4	-4.4	-33.5	
WS6 (former DS6)	2020 Oct2021 Apr (mean)	-14.0	-6.0	(-30.5)	
	2021 June-July	-13.5	-5.5	-30.7	
	2021 Aug-Sep	-22.4	-14.4	-29.6	
Oval BA	2020 Aug2021 Oct (mean)	-17.0	-9.0	-33.6	
	2021 May	-14.2	-6.2	-33.4	
	2021 July-Sep	-18.5	-10.5	-33.7	
Smaller AWO	2020 Aug2021 June (mean)	-15.5	-7.5	-33.5	
	2021 June-Oct	-13.2	-5.2	-33.4	
F. end dark STB	2020 Aug2021 June (mean)	-15.5	-7.5	(-30.5)	
	2021 June-Oct	-14.2	-6.2	-30.7	
Spot 8	2021 Aug-Sep	-21.0	-13.0	(-30)	
MEAN		-15.3	-7.3	-32.1	
S.D.		3.5	3.5	1.6	
This table lists speed	s that were averages between app	aritions, or	sustained f	or at least a	month
ignoring minor fluct	uations.				
For spots in STBn and	STBs jets, which had a wide rang	e of speeds	and latitude	es, see 7DP fi	gures



Figure 1. A selection of stripmaps of the S. Temperate and adjacent domains from images by amateur observers in 2021.

All figures (except the Supplementary Figures S1 to S4) have north up and System 3 longitude (L3), though L2 is added for some maps here.

In addition to S. Temperate features, AWOs A1-A8 in the S.S. Temperate domain are labelled.



Figure 2. Strip-maps from JunoCam images at PJ33-PJ35. Diagonal green arrows indicate spots retrograding from DS7 as indentified in our ground-based analysis (Fig.S1).



Figure 3. Strip-map from images by amateur observers at PJ36 on Sep.1-3. This map can be compared with maps on Sep.4-5 by amateurs (Fig.1) and by Hubble (Fig.4).



Figure 4. Strip-maps from HST (OPAL) on Sep.4, in RGB & UV & CH4, aligned. Also see the blink animation of two RGB maps ~10 hours apart: Anim-2). On this date, DS7 and the F-Spectre were close to coming into contact.



Figure 5. JUPOS chart of longitude vs time, showing the tracks of all the features described in this report. (For an equivalent chart in L2 in reverse orientation, see Suppl.Figs. S2 & S3.)

Figure 6. JUPOS chart of longitude vs time for oval BA over 4 years, in a longitude system moving at DL3 = -8.5 deg/30d. Blue and green marks indicate its p. and f. ends.





Figure 7. Some of the highest-resolution images in RGB, with companion images in CH4: May 17-29 & June 1. (Please see Fig.1 for annotations.)



Figure 8. Selected multispectral images in the 889 nm methane band (CH4), near-ultraviolet (UV), and RGB or IR continuum: May 24-28 & June 5-6. All are by Clyde Foster except for the last row. (Please see Fig.1 for annotations.)



Figure 9. Some of the highest-resolution images in RGB in August, with some companion images in CH4 and UV. (Please see Figs.1&4 for annotations.)

Figure 10. JUPOS chart for spots in the STBn jet (black points), in a longitude system moving at DL3 = -90 deg/30d. Bright spots in the same latitude band appear as cyan points, and tracks of major features are overlaid.



Figure 11. Spot 8: The precursor cyclone (July 31 to Aug.7: yellow arrowhead in (A), arrow in top row of (B), enclosed in red oval in enlargements in (B) & the methane-bright outbreak on Aug.7 (red arrowhead in (A)) and its evolution over the next few days.

(*Right:* A) Cylindrical map projections by E. & J. Sussenbach (upper left enlargements) and S. Mizumoto (all others).

(*Below:* B) Unprojected images. In the enlargements, dark blue arrows indicate a STBn jet spot being deflected around the S edge of the GRS.







Figure 12. Spot 8 (red arrowhead): V-hi-res images showing its further development around the time of opposition (Aug.19/20). Images are ~10 hrs apart on Aug.19 and ~10-20 hrs apart on Aug.26-27; rapid changes can be seen.



Figure 13. JunoCam closeups of Spot 8 at PJ36 (A: Sep.2) and PJ38 (B: Nov.29). [Also see Hubble image in Fig.4.] Red arrows indicate STBn jet spots.

Supplementary Figures

Figures S1 to S4 present maps and JUPOS charts with south up and System 2 longitude (L2).



Figure S1. Maps by Shinji Mizumoto: three excerpts from his much longer series, selected to encompass the JunoCam maps from PJ33, PJ34 & PJ35 (shown larger in Fig.2). Diagonal green arrows indicate spots retrograding from DS7. Diagonal orange & red arrows indicate spots prograding in the STBn jet, from DS7 or from the WS6 region respectively.



Figure S2. JUPOS chart for the S2 domain. (A chart in L3 in opposite orientation is in Fig.5.)

Figure S3. Chart of drift rate vs latitude for spots in this domain (Zonal Drift Profile: ZDP) compared with the Zonal Wind Profile (ZWP) from Cassini in 2000. Some spots are represented by multiple points for track segments with different drift rates.





Figure S4. (A) JUPOS chart for dark spots in the STBn jet, in L2. Different colours denote different latitude ranges. (See also Fig.10.) (B) ZDP from these data. Symbols with a vertical bar denote spots which were decreasing in latitude without change of speed.