

Jupiter's South Temperate Domain, 2012-2015

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Figure legends & miniatures

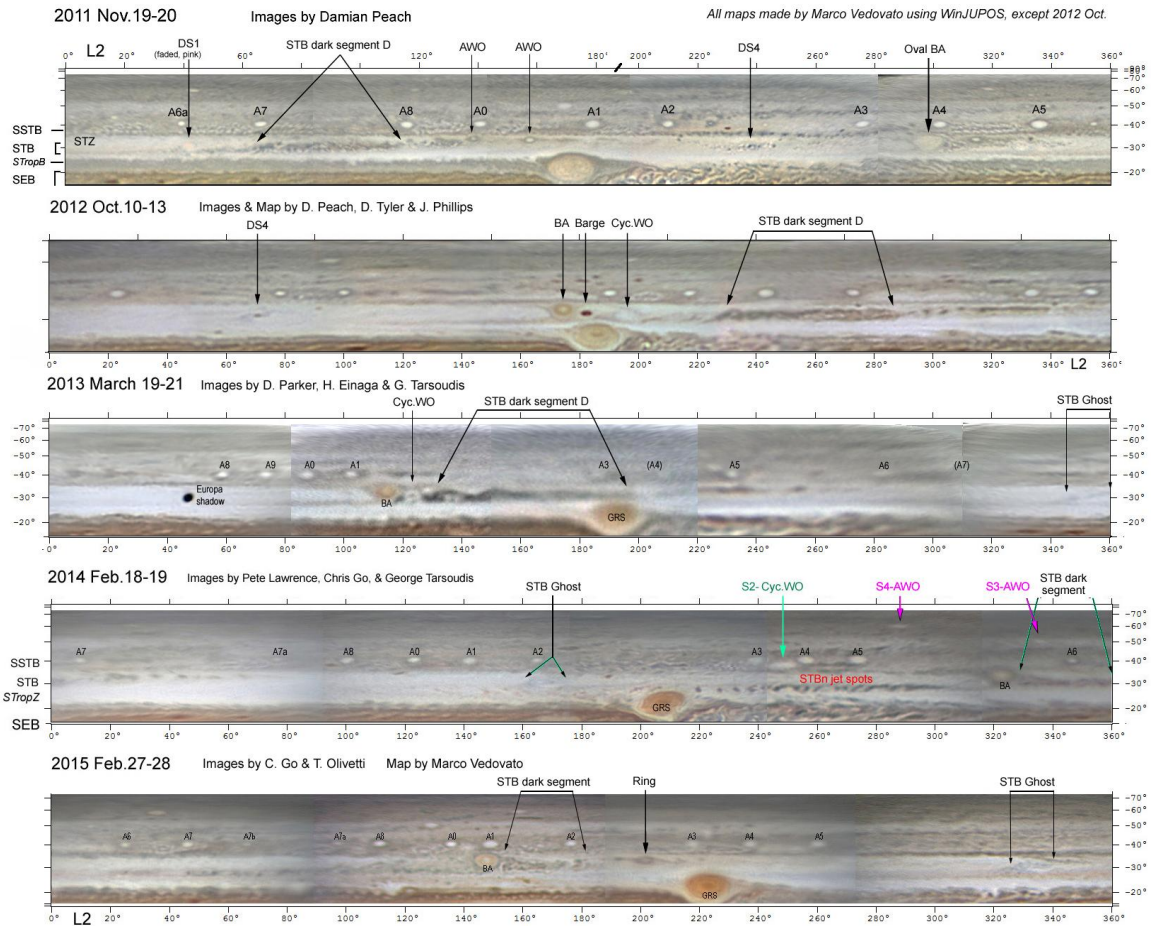


Figure 1. Maps of the southern hemisphere from 2011 to 2015, with major features labelled in the S. Temperate (S1) domain (arrows) and S2 domain (small AWOs named A0 to A8). South is up in all figures.

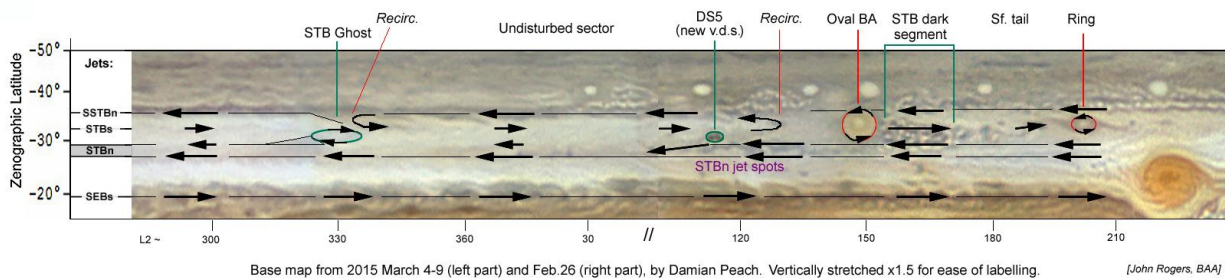
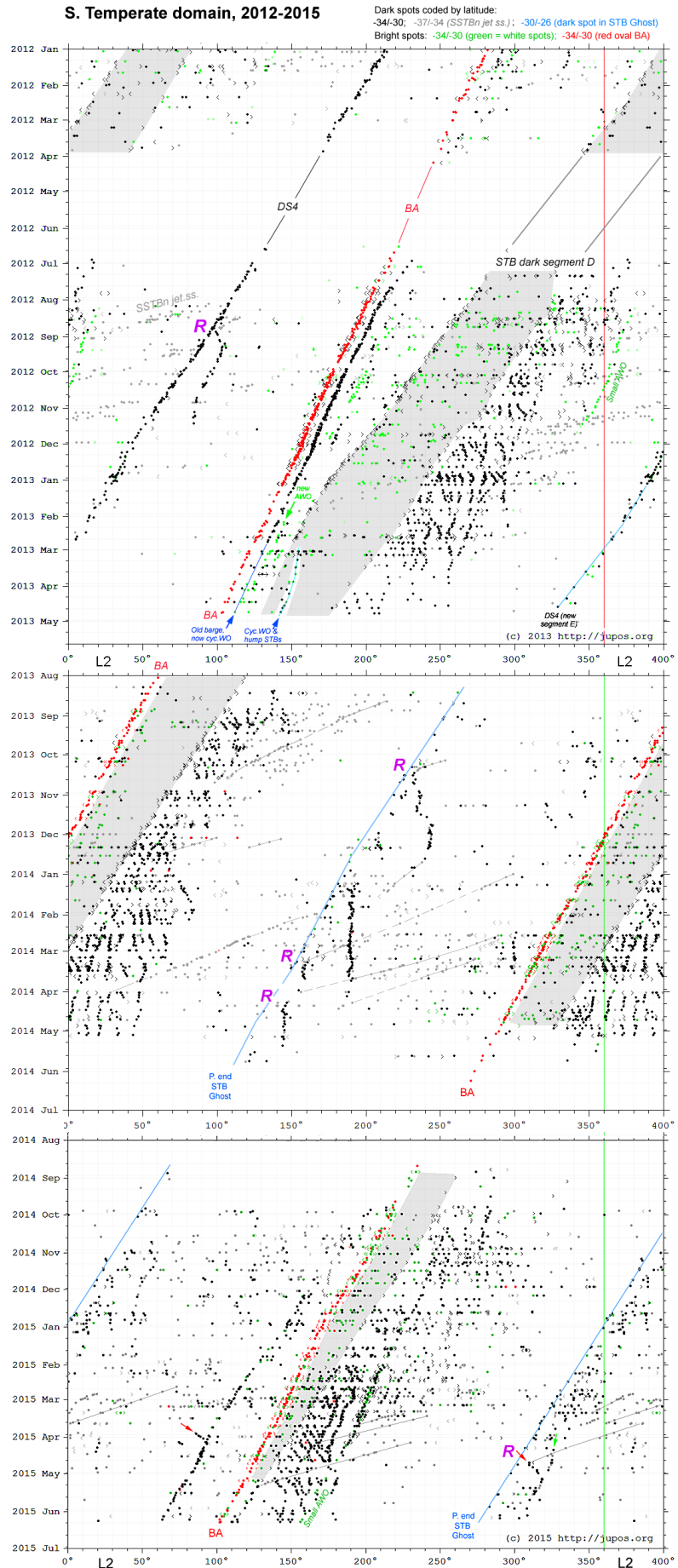


Figure 2. Diagram of the jets and circulations in the S. Temperate domain, as described in this report. Lines mark the peak latitudes of the fastest jets. The base map is from early 2015, by Damian Peach.

Figure 3. JUPOS chart of longitude (L2) vs time for all features measured in the S. Temperate domain, 2012-2015. See key at top. 'R' marks recirculation events from the SSTBn jet (grey points) into the STZ (black points), at the STB Ghost.



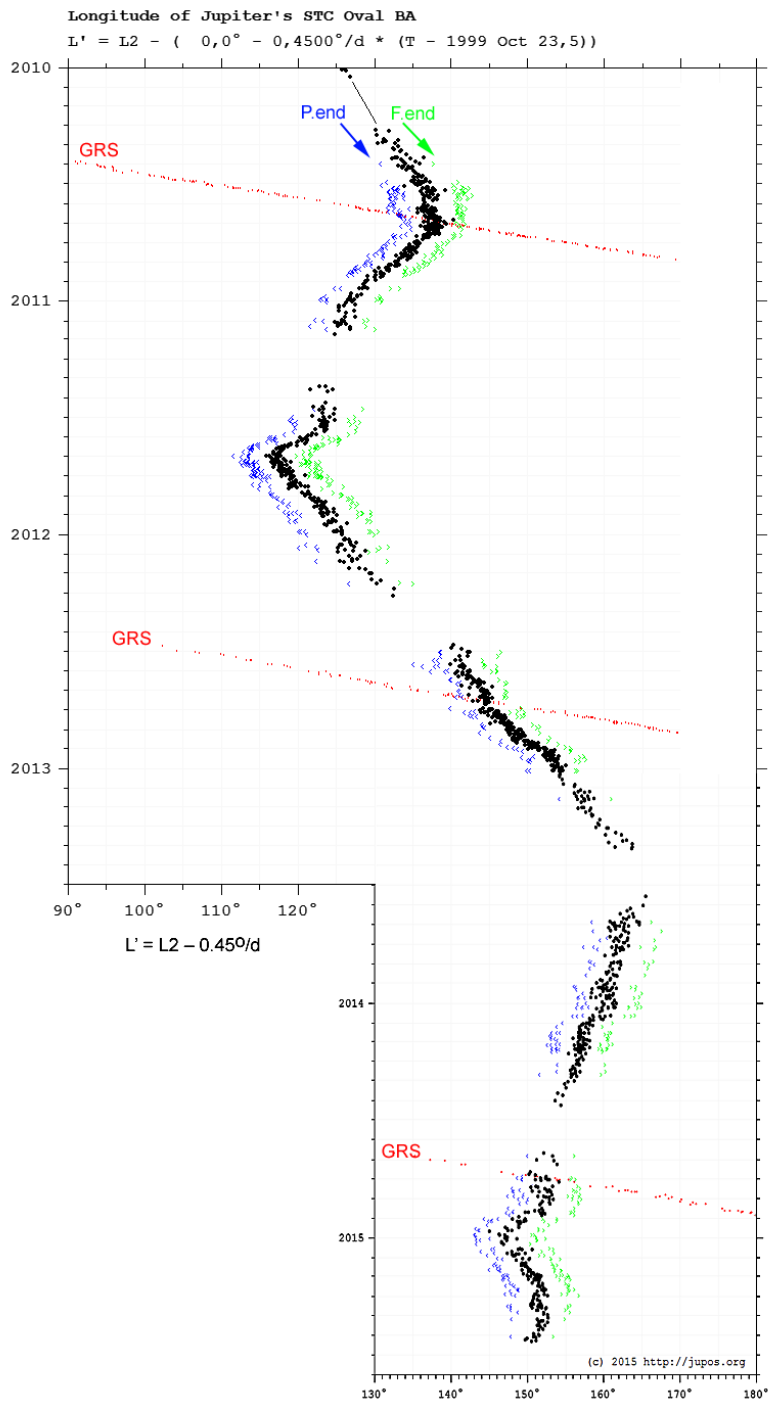


Figure 4. JUPOS chart of longitude vs time for oval BA. Longitude scale is $L2 - 0.45$ deg/day.

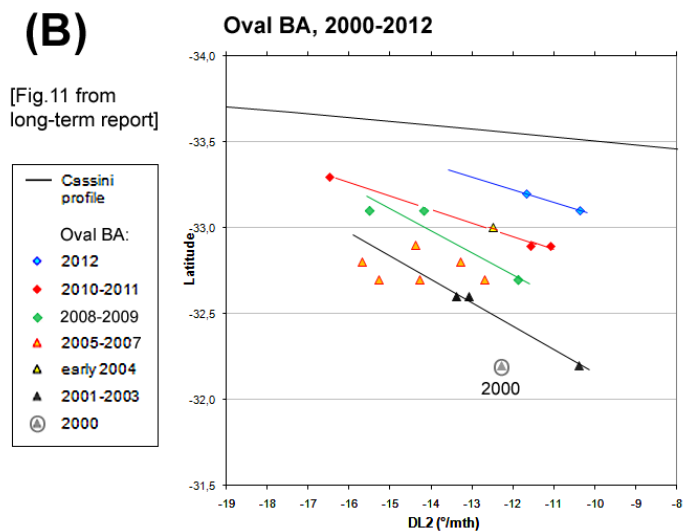
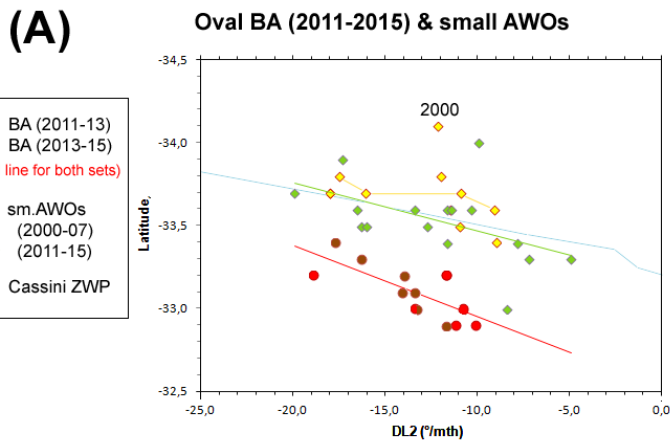


Figure 5. Zonal drift profiles (ZDPs) for oval BA.

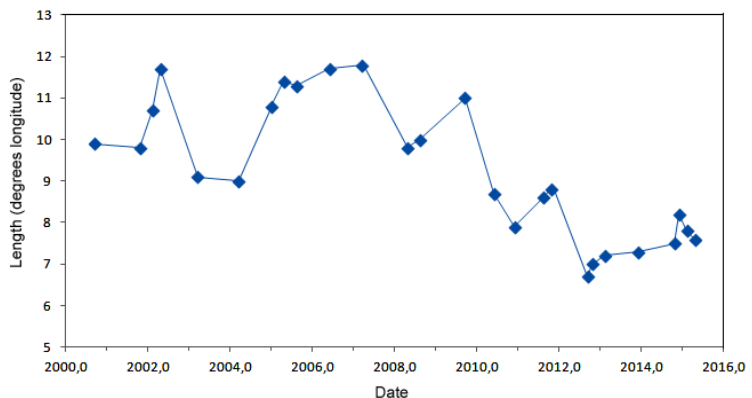
(A) Oval BA in 2011-2015, and small AWOs (rings) in these and earlier years. (In 2006 the small AWO was oscillating, as shown by 4 yellow points connected by yellow lines. The anomalous latitude for the small AWO in 2000 is unexplained, possibly related to the recent formation of oval BA, although these early measurements could be less accurate.)

(B) Oval BA in earlier years, from Ref.1 (Fig.11). The ZDP shifted southward at ~ 0.1 deg per year, probably due to shrinkage of the oval. This trend has not been continued in (A).

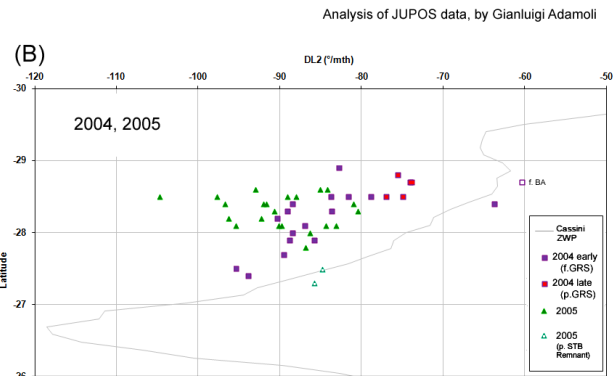
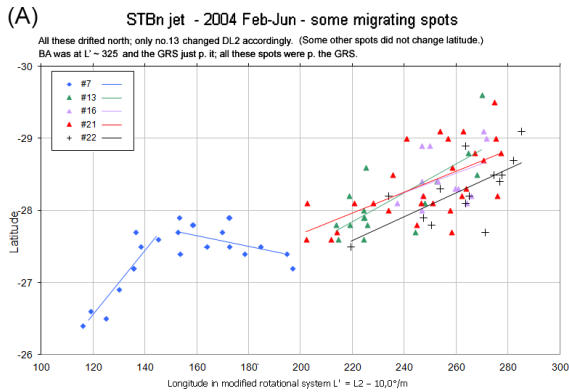
Length of oval BA, 2000-2015

(All images; JUPOS data)

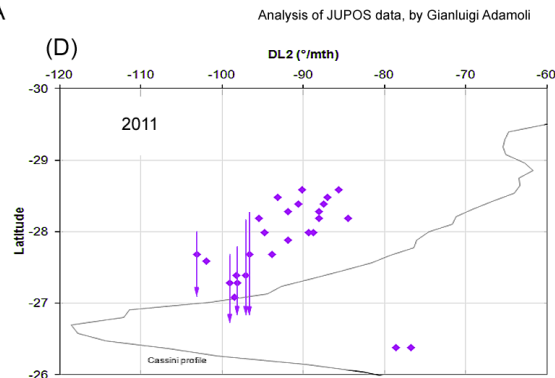
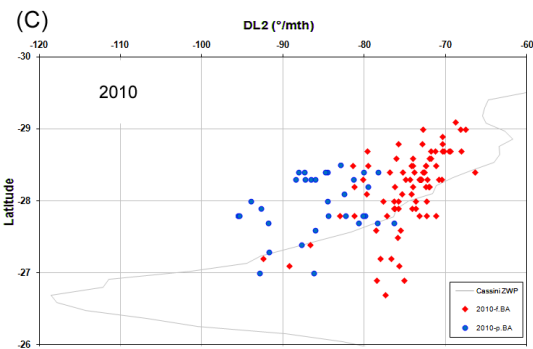
Figure 6. Length of oval BA vs time, from JUPOS measurements in all wavebands (mostly RGB). (Measurements on red and infrared images did not differ significantly.)



STBn jet spots in the 2004-2005 outbreak



STBn jet spots in the 2010-2011 outbreak p. oval BA



STBn jet spots, 2013/14:

(E) Tracks of some spots

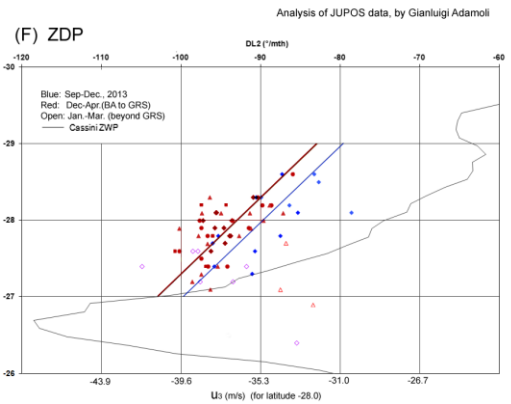
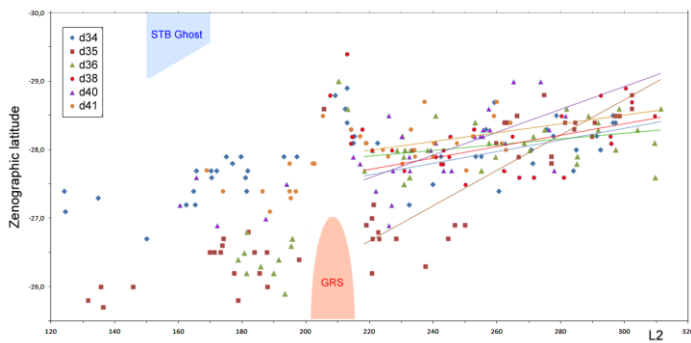


Fig. 7. STBn jet spots in three separate outbreaks: Tracks of spots, and ZDPs.

(A,B) STBn jet spots in the 2004-2005 outbreak.

(A) Tracks of some spots which were moving northward in 2004, plotted as longitude (in a system moving at -10 deg/month to minimise motion of oval BA) versus latitude. All were p. the GRS. The spots move from right to left; trend-lines (fitted by Microsoft Excel) show the decline in latitude. (Similar northward shifts have been seen in all apparitions analysed.)

(B) ZDPs for all spots in 2004 and 2005. In this and other ZDP charts, the mean ZWP from Cassini (Porco et al., 2003) is shown for comparison.

(C,D) STBn jet spots in the 2010-2011 outbreak: ZDPs for (C) 2010 and (D) 2011. [The latter was previously posted in Ref.1.] Downward-pointing arrows indicate the range of latitudes through which five spots migrated over time.

(E,F) STBn jet spots in the 2013/14 outbreak.

(E) [from Ref.5] Tracks for 6 well-tracked spots, plotted as longitude (L2) vs latitude. Positions of the GRS and the STB Ghost are indicated schematically. The spots move from right to left; trend-lines (fitted by Microsoft Excel) show the decline in latitude down to the GRS. Note the marked increase in latitude as each spot passed the GRS, and for those which survived, return to an approximate extrapolation of the previous track.

(F) ZDP. For early spots (blue), the mean speed and the ZDP were slower than for later spots (red). Trend lines have been drawn by eye. Spots which had passed the GRS (open diamonds) had lower latitudes and a range of speeds; spots which then continued beyond the STB Ghost (open triangles) had much slower speeds. For charts broken down by month, and more individual tracks, see [Ref.5]. For ZDP in 2014/15, see **Appendix 1**.

APPENDIX 1: Jupiter in 2014/15, Report no.8: S1 domain (S. Temperate region)

Maps of the southern hemisphere, 2014/15

All maps made by Marco Vedovato unless otehrwise stated.

Compilation by John Rogers

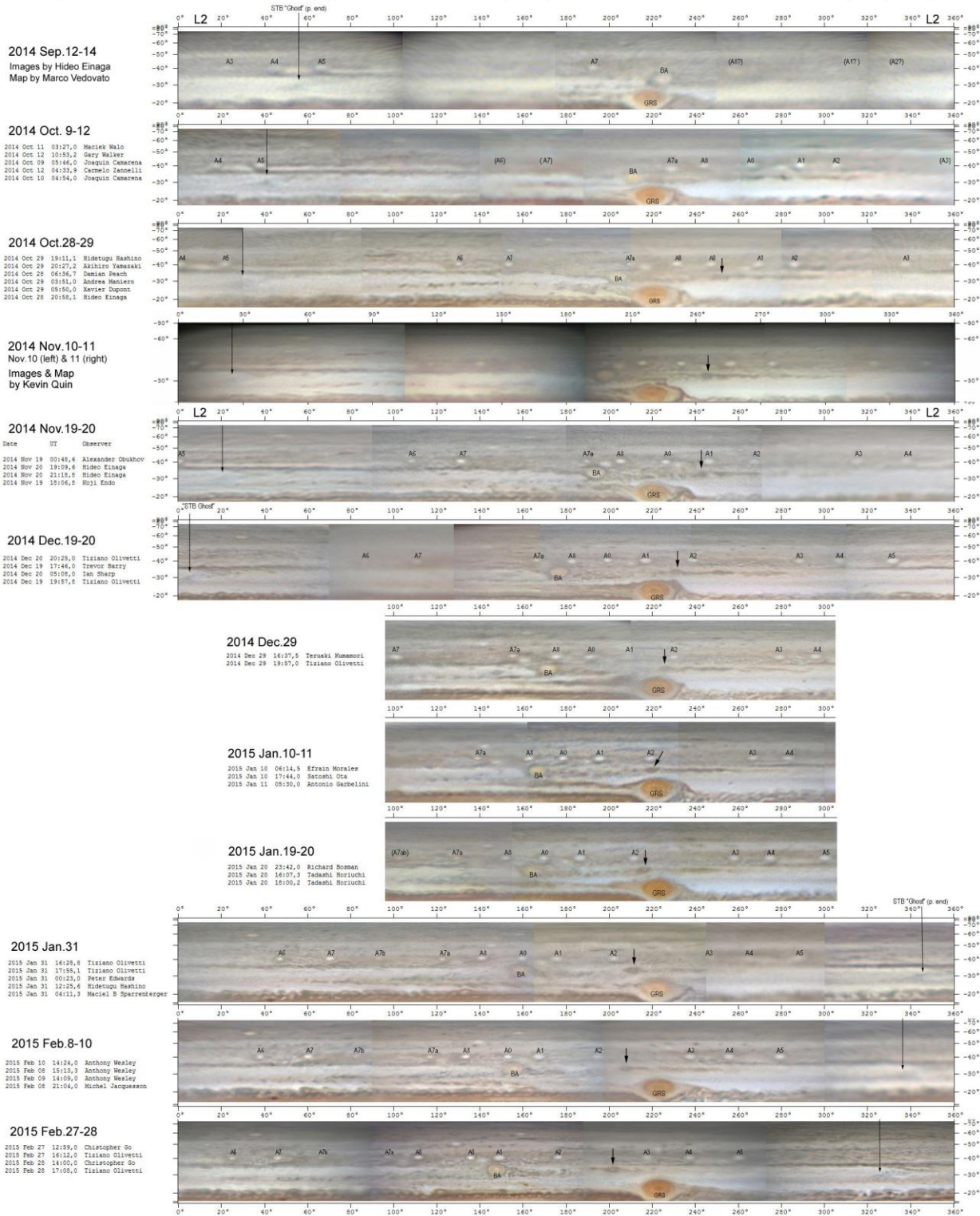


Figure A1. Maps of southern latitudes [Caption on next page.]

Figure A1. Maps of southern latitudes, 2014 Sep. to 2015 Feb. All maps were produced by Marco Vedovato using WinJUPOS, from images by the named observers, unless otherwise stated. Arrows indicate the grey triangle at the p. end of the STB Ghost, and the dark condensation which became an anticyclonic ring in the Sf. tail of the STB dark segment. The AWOs in the S2 domain are also named (A0 to A8).

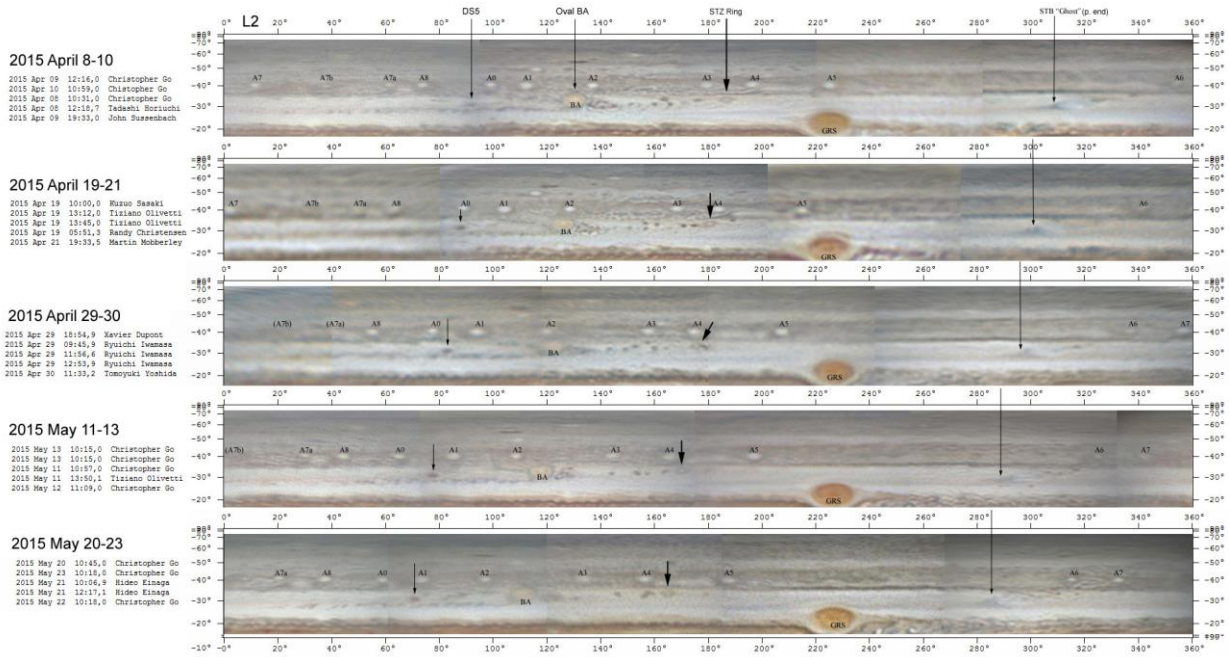
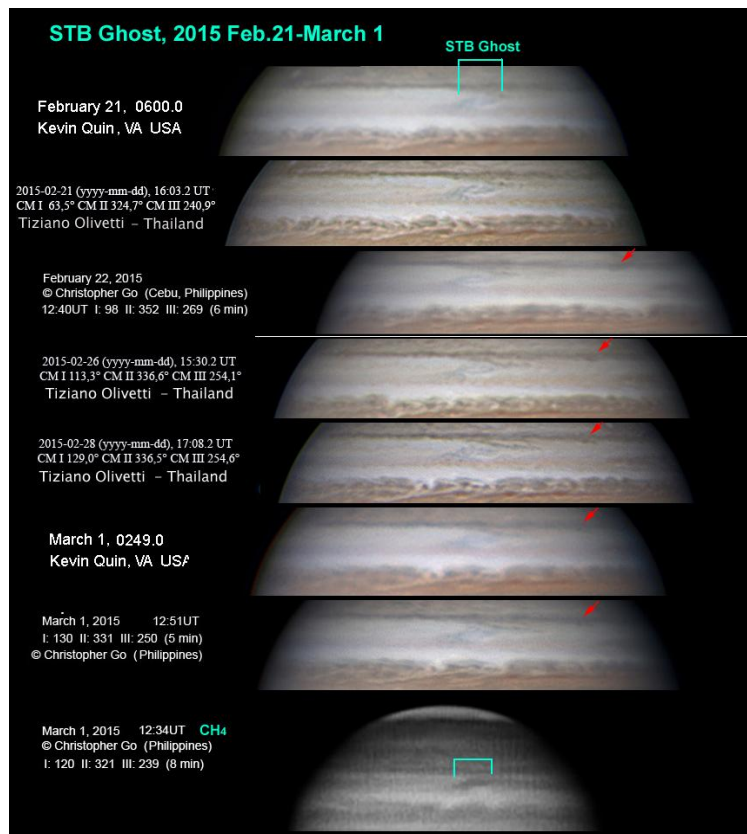


Figure A2. Maps of southern latitudes, 2015 April-May. (As Fig. A1.)

Figure A3. Images of the STB Ghost, 2015 Feb.21 to March 1. Little systematic motion can be detected in it, except for a probable clockwise (cyclonic) circulation of the pale blue 'loop' on Feb.21-22. (The dark spot at the Sf. end is approx. stationary.) A dark spot is approaching in the SSTBn jet (red arrow). At bottom, methane image: note the STB Ghost is methane-dark.



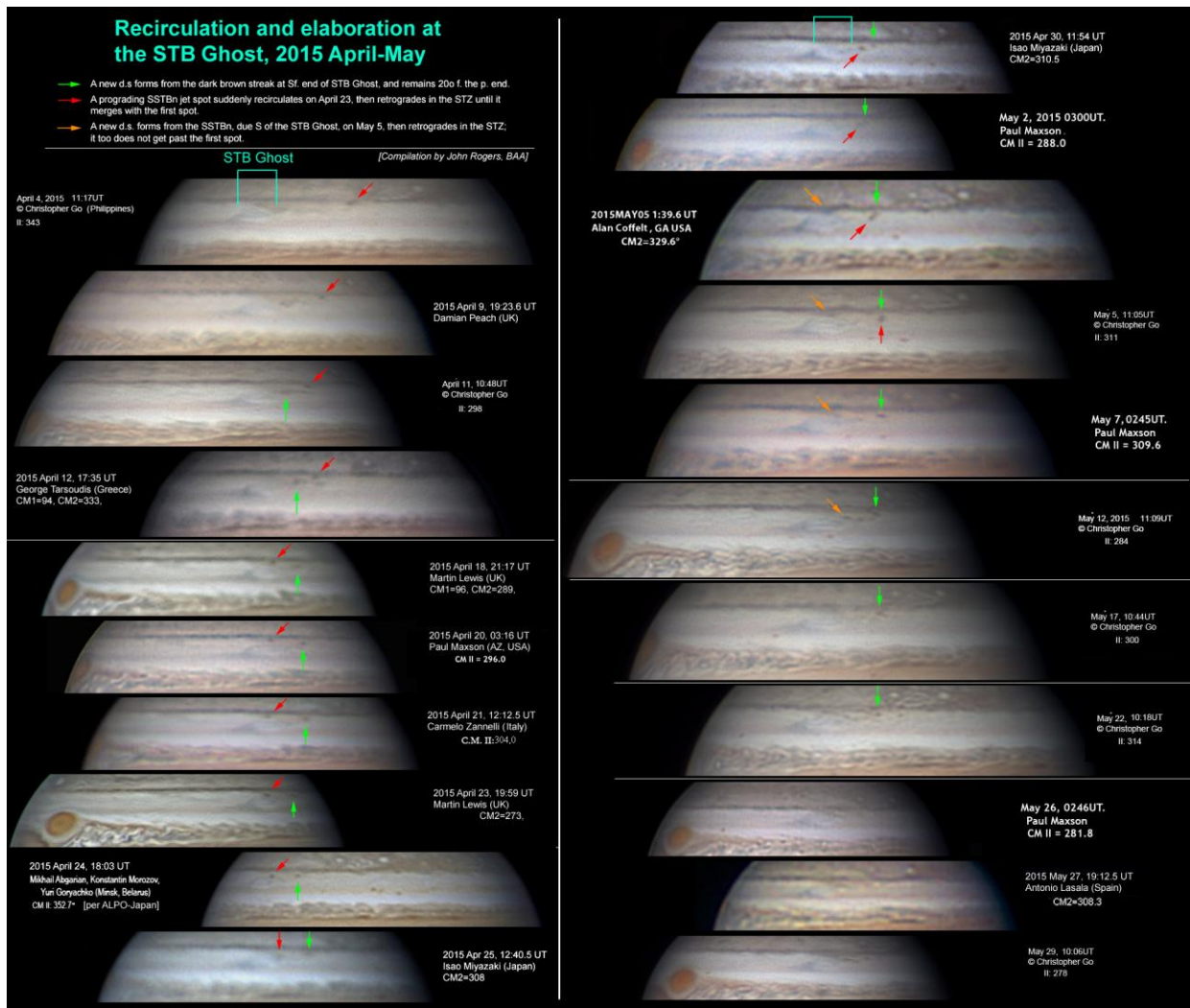


Figure A4. Images of the STB Ghost, 2015 April-May, showing small spots moving alongside it as described in the figure and the text.

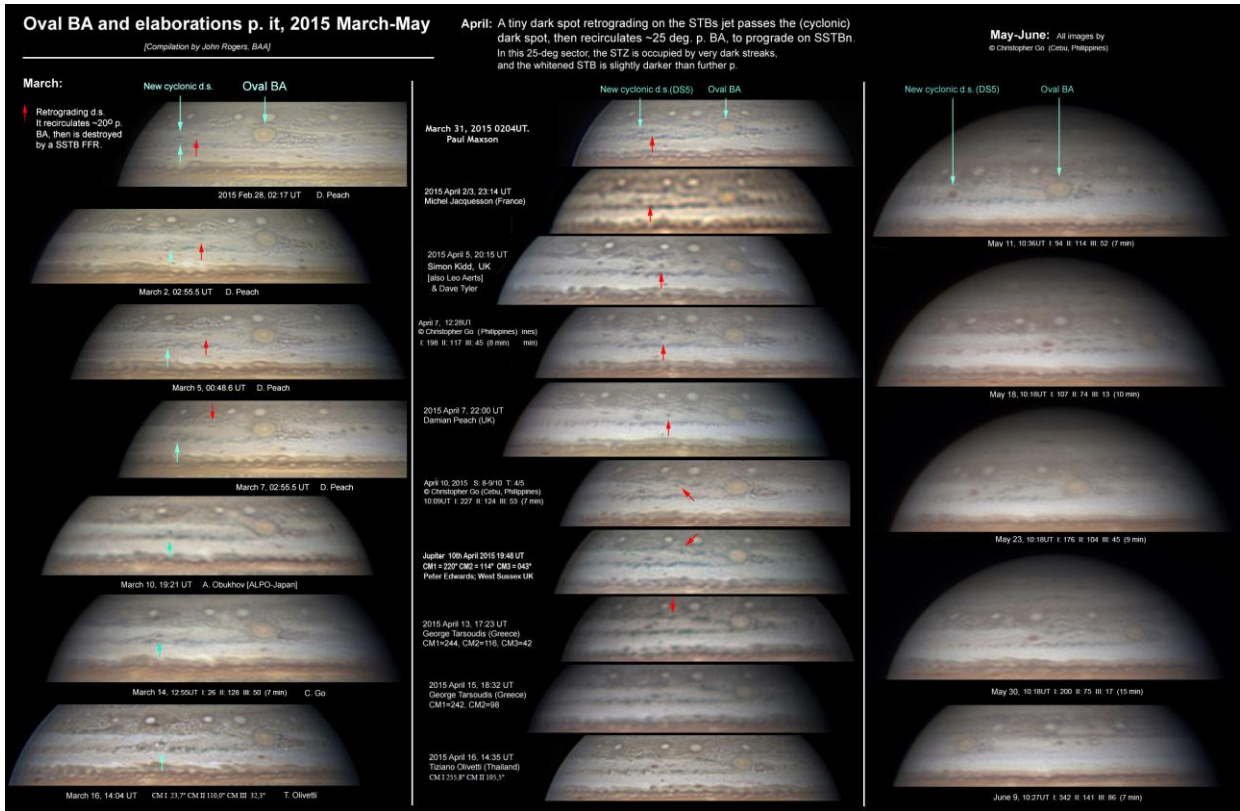


Figure A5. Images of oval BA and environs, 2015 March-May. Interesting features are described on the figure and in the text. The ‘new cyclonic dark spot’ is DS5.

Zonal drift profile for S. Temperate domain, 2014/15 (JUPOS data analysed by G. Adamoli)

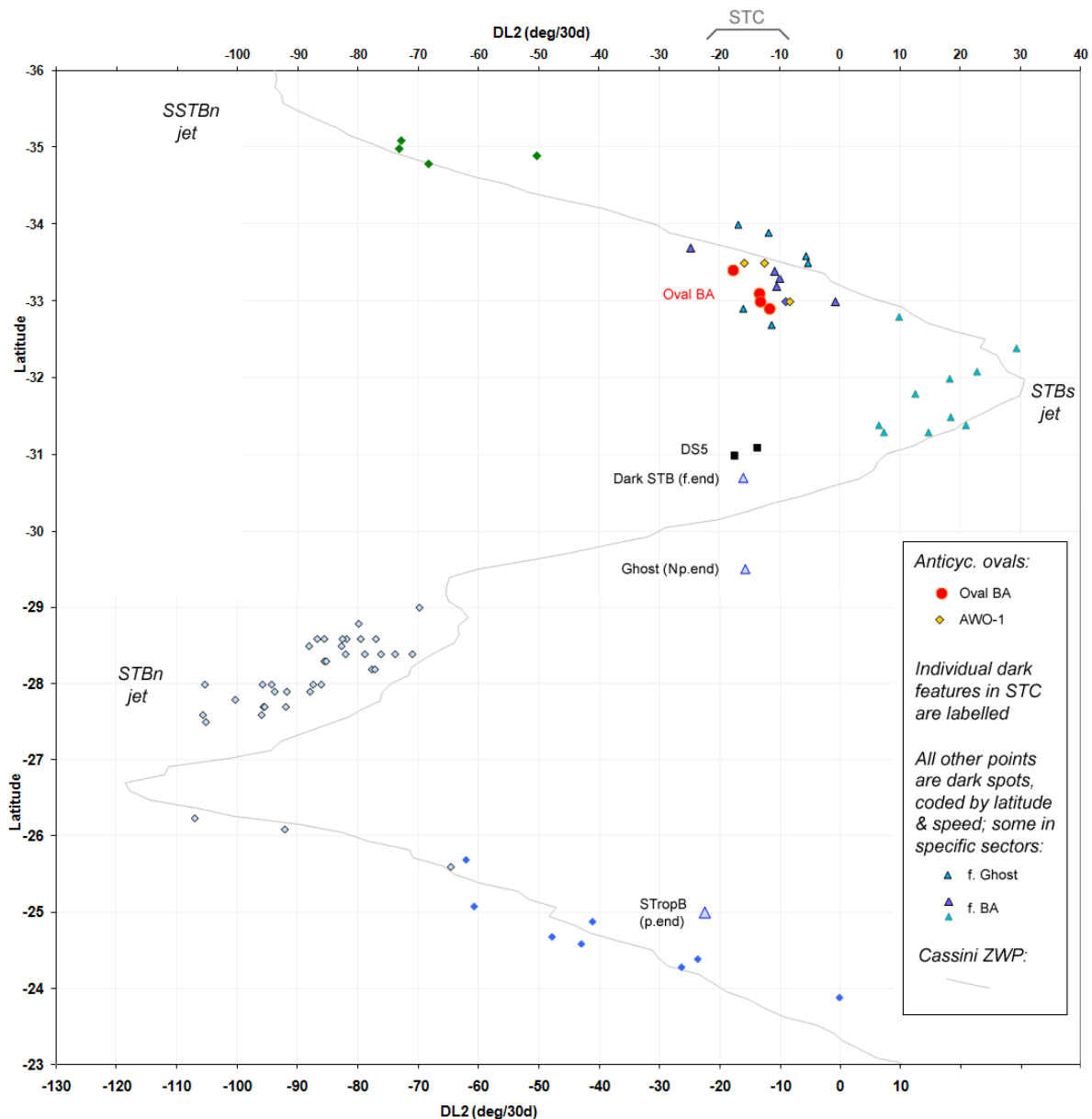


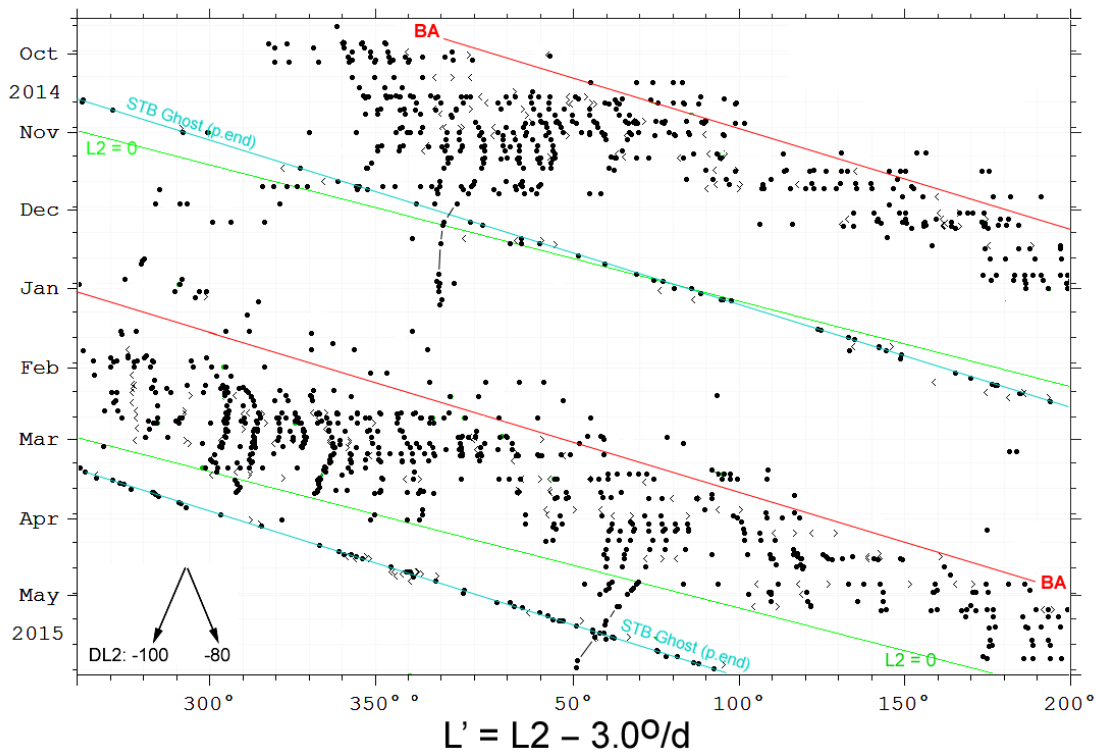
Figure A6. Zonal drift profile for the S. Temperate domain, 2014/15, with the Cassini ZWP for reference. Note that major features (named) drift with the classical S. Temperate Current, i.e. DL2 ~ -10 to -20 deg/mth, while smaller spots follow more extended ZDPs consistent with the ZWP or (for the STBn jet) a regional variation thereof. The grey triangle of the STB Ghost appears anomalously northerly because it was the Np. end of a coherent feature that spanned several degrees to the south. Conversely DS5 appears anomalously southerly, for unknown reason – perhaps another clue to the complex dynamics of its location.

STBn jet, 2014/15

(A) Latitudes -30/-26

$$L' = L2 - 90^\circ/\text{month}$$

(c) 2015 <http://jupos.org>



(B)

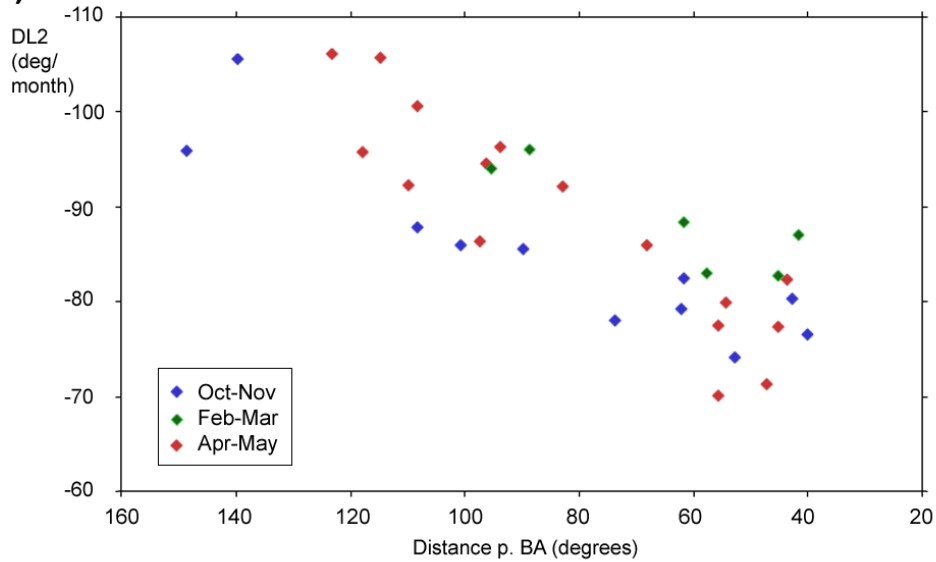


Figure A7. STBn jet outbreak, 2014/15.

(A) JUPOS chart of the dark spots, showing how they arise just p. oval BA, drifting with DL2 ~ -80 deg/mth, then accelerate to DL2 ~ -100 deg/mth.

(B) Chart of DL2 vs distance p. BA (for the mid-point of each measured track segment).