

Jupiter's high northern latitudes: patterns and dynamics of the N3 to N6 domains

John Rogers , Gianluigi Adamoli, Michel Jacquesson, Marco Vedovato, & Hans-Jörg Mettig

Figures (mini-copies)

[Note: Different figures have different orientations!]

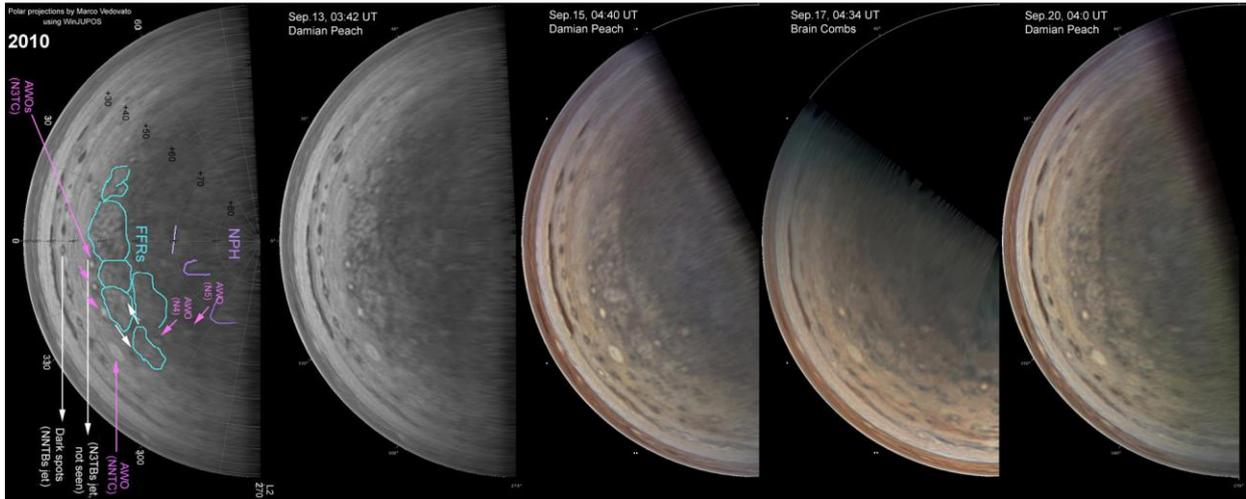


Figure 1. North polar maps from some of the best amateur images (from our report, ref.9 Fig.23). It includes FFRs in the N4 domain changing shapes over just a few days, and an AWO in the N5 domain which had just reversed its drift.

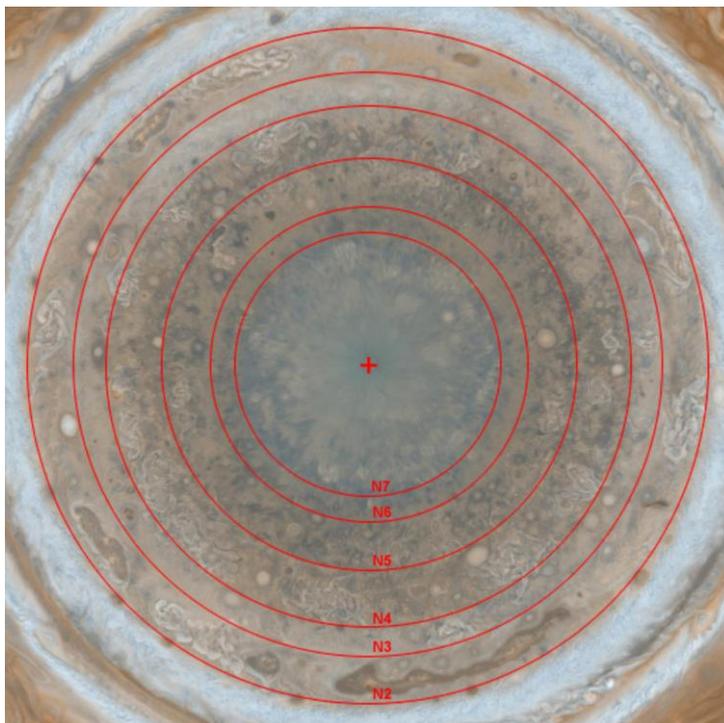


Figure 2. North polar map from Cassini (Credit: NASA/JPL/Cassini imaging team, PIA07783), with prograde jets marked.

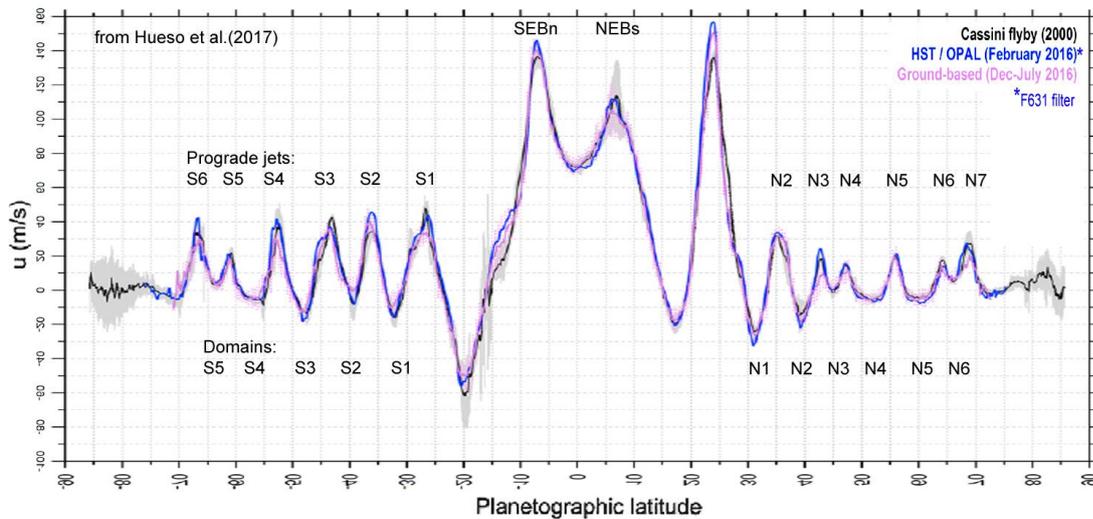
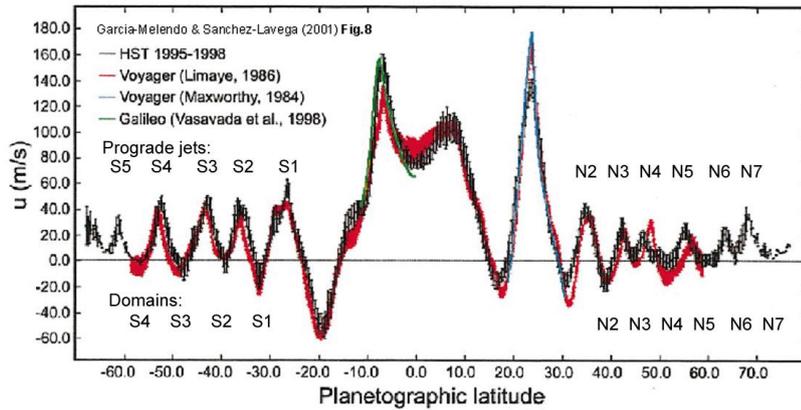


Figure 3. Zonal wind profiles from spacecraft.

Top: Voyager (1979; red) and Hubble (1995-1998; black) (adapted from ref.21).

Bottom: Cassini (2000; black) and Hubble (2016; blue) (adapted from ref.22).

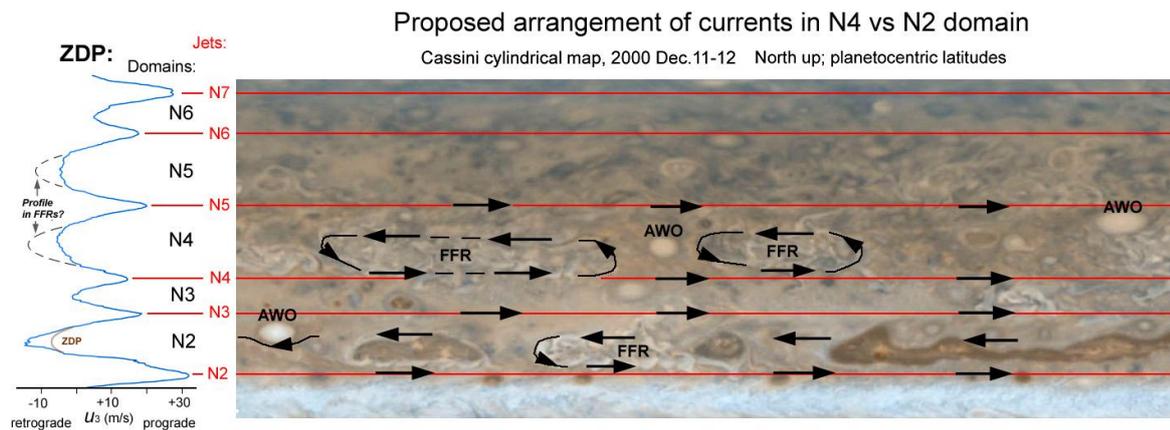


Figure 4a. Proposed arrangement of currents in N4 and N2 domains. In the N2 domain, the ZWP indicates a sharp, continuous retrograde jet, but the ZDP is blunter, thus encompassing the ZSC (NNTC) which governs the motion of large belt segments and FFRs. In the N4 domain, the ZWP is the same as the ZDP, with a blunt profile that coincides with the ZSC (N4TC) that governs the motions of the large FFRs and some AWOs; but faster retrograde winds presumably occur within FFRs (Fig.4b). (The background cylindrical map is from Cassini: NASA PIA07782, edited.)

Map from HST IR images
 2012 September 20 / 763 nm
 © NASA/ESA HST, G. Scheider team
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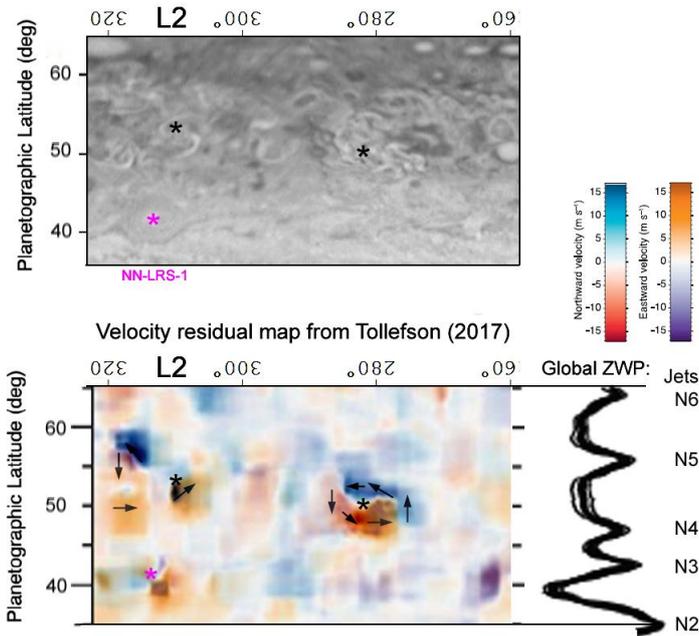


Figure 4b. *Top*, part of map from Hubble on 2012 Sep.20 (ref.24; see also Fig.10, inverted). *Bottom*, coincident map of velocity deviations from the global ZWP shown at right, colour-coded as at top right; small arrows indicate the local velocities. (Adapted from ref.16.) Asterisks indicate matching points: black, cyclonic (large FFR near centre, more complex at left); magenta, anticyclonic (NN-LRS-1, circulation not resolved).

Zonal drift profile

JUPOS data from all fully analysed apparitions (2005, 2006, 2011/12, 2014/15, 2015/6) plus some fast points from other years (♦)

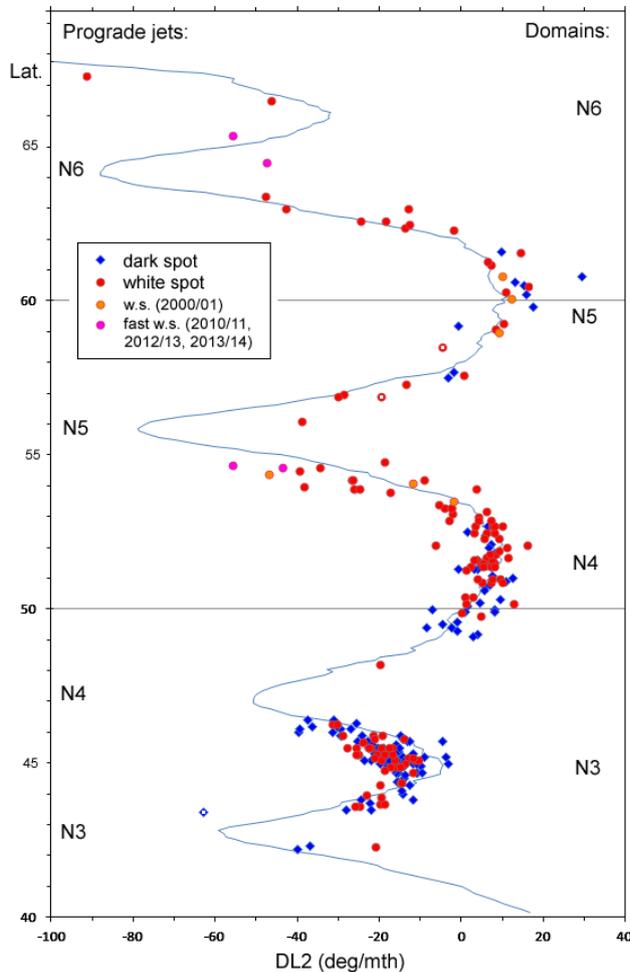


Figure 5. Zonal drift profile from JUPOS data. (Open symbols are imprecise.)

N3 jet spots on JUPOS charts

$L' = L3 - 30 \text{ deg/mth} = L2 - 38 \text{ deg/mth}$.
 Purple numbers: DL2 (deg/mth).
 (Lats. +41/+44)

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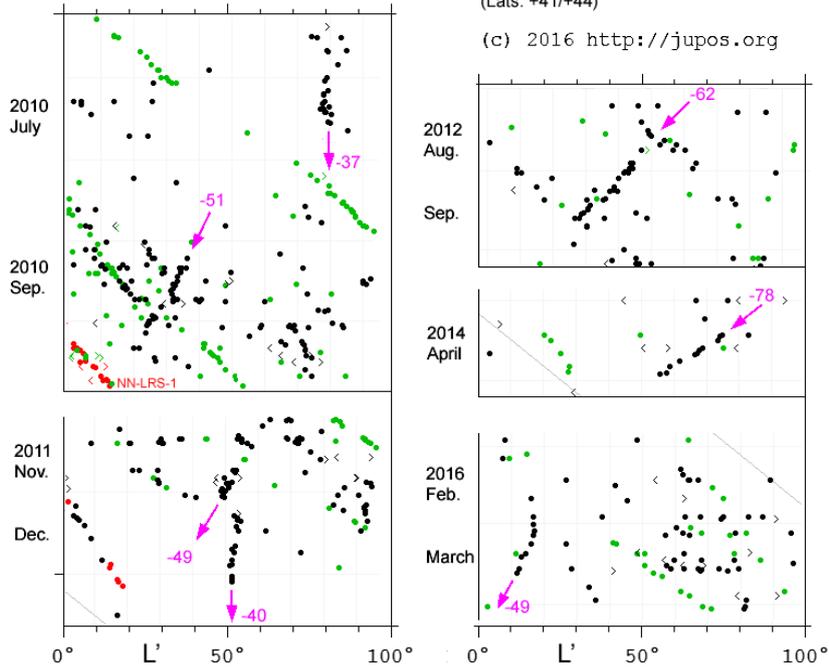


Figure 6a. Excerpts from JUPOS charts showing spots on the N3 jet, on a longitude scale moving at $DL2 = -38 \text{ deg/mth}$. DL2 for each spot marked is shown in magenta.

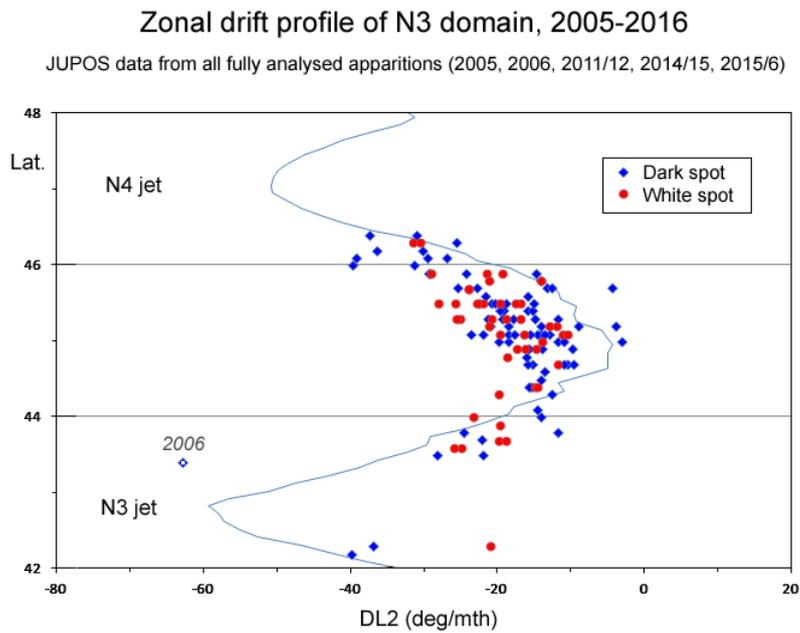
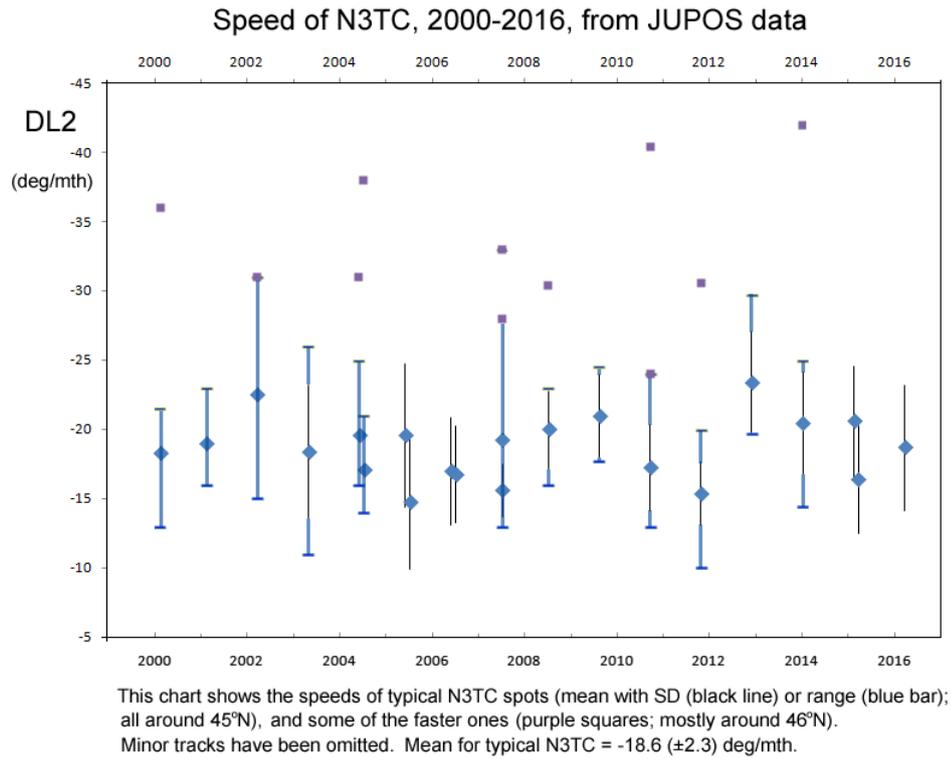
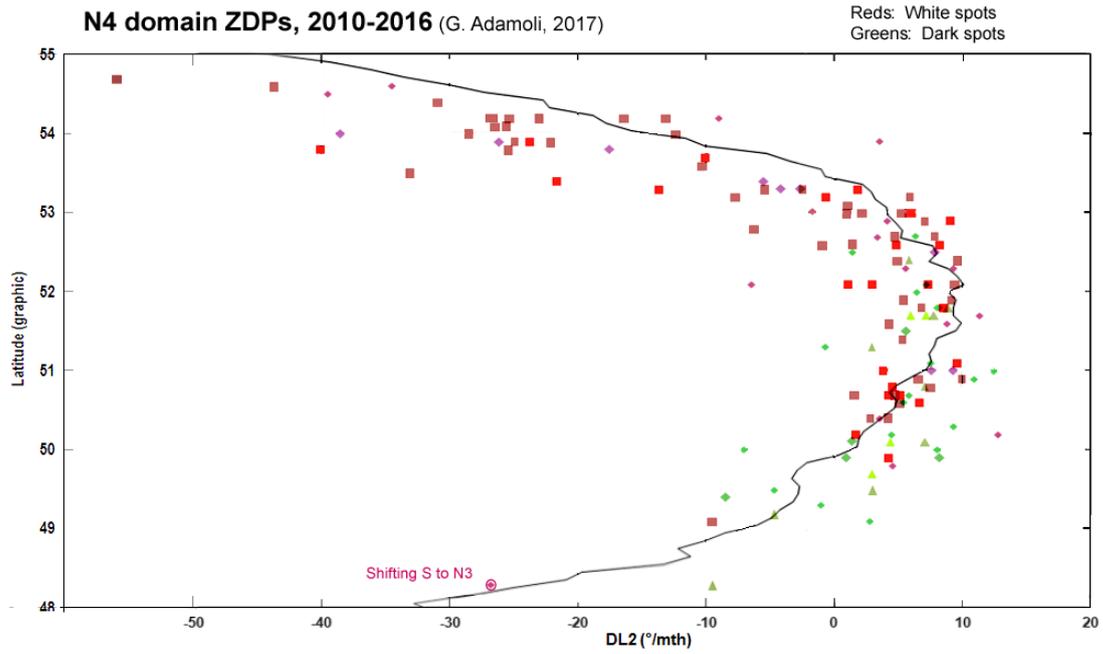


Figure 6b. *Top:* Speed of N3TC, 2000-2016, from JUPOS data.
Bottom: ZDP of N3 domain, 2005-2016, from JUPOS data.



N4 domain 2010 to 2016 - statistics

(JUPOS data - GA analysis)

DL2 (degrees per 30 d) bins are marked by mid-point

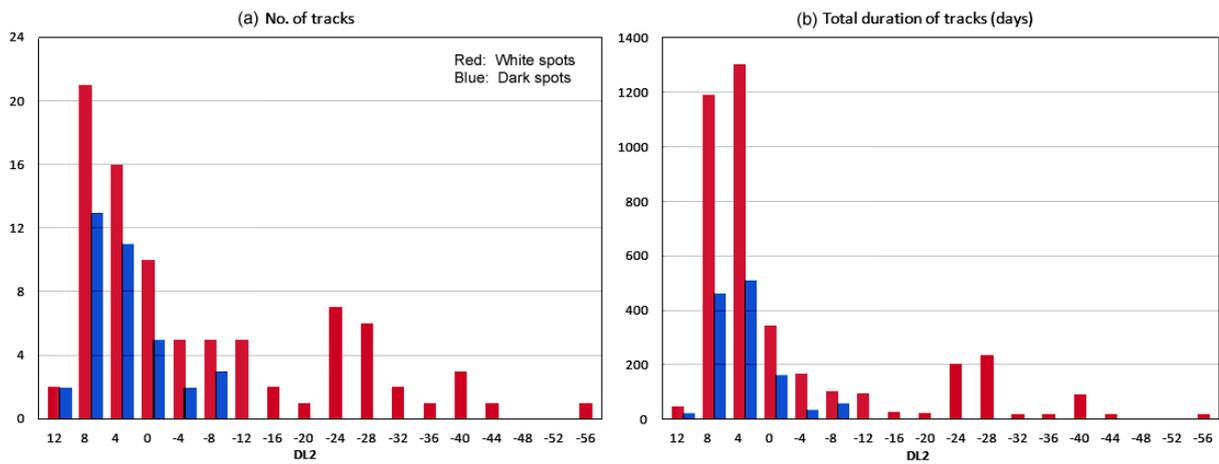
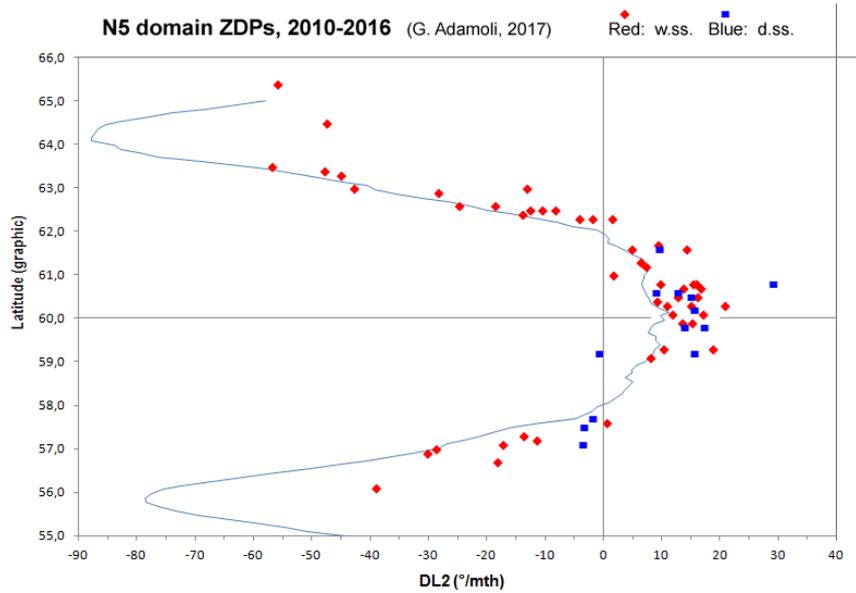


Figure 7. *Top:* ZDP of N4 domain, 2010-2016, from JUPOS data. *Bottom:* Histograms of speeds; (a) by number of track segments measured; (b) by total duration of tracks measured.



N5 domain 2010 to 2016 - statistics (JUPOS data - GA analysis) DL2 (degrees per 30 d) bins are marked by mid-point

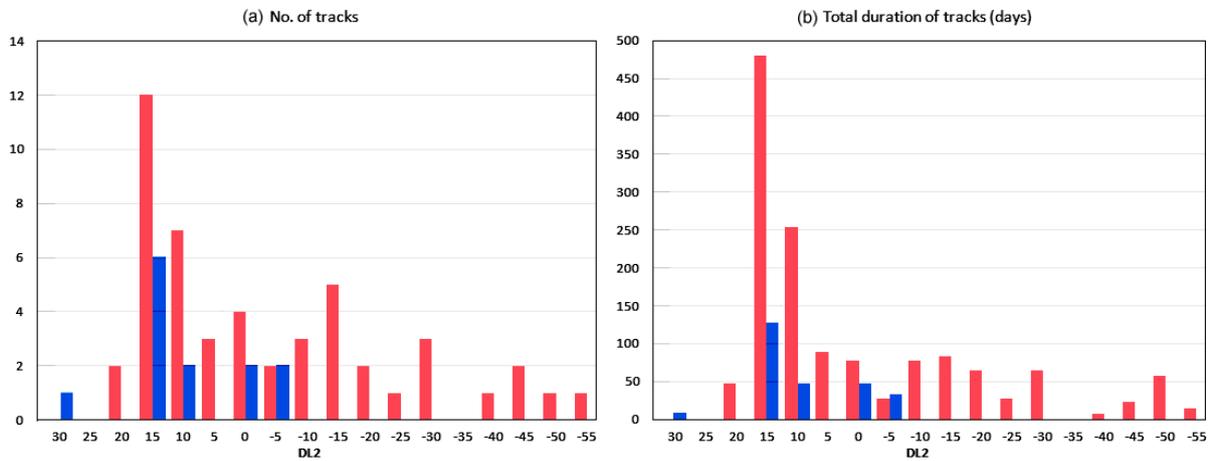


Figure 8. *Top:* ZDP of N5 domain, 2010-2016, from JUPOS data. *Bottom:* Histograms of speeds; (a) by number of track segments measured; (b) by total duration of tracks measured.

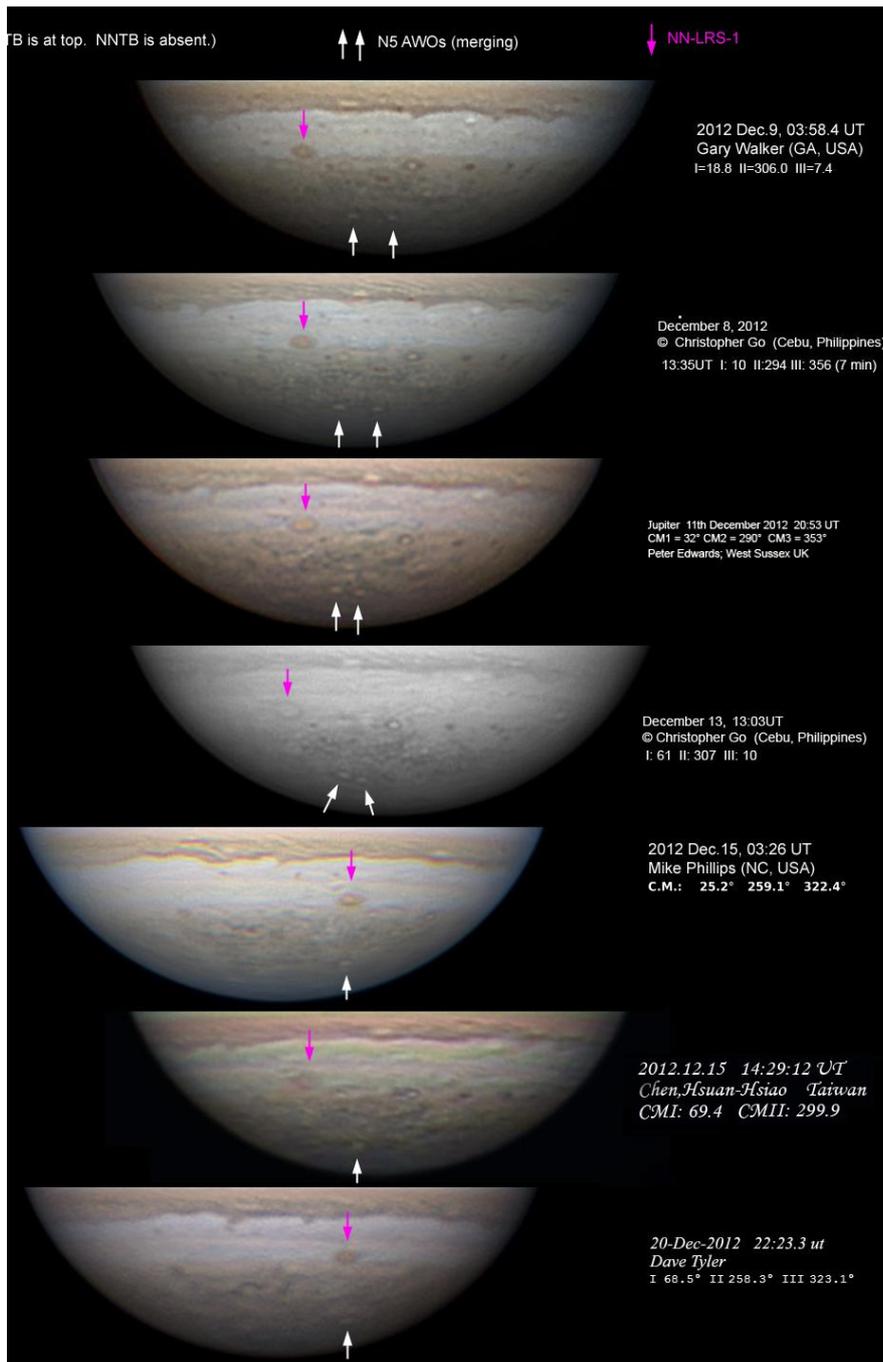


Figure 9. Amateur images showing two N5 AWOs merging in 2012 Dec. NN-LRS-1 (then a red oval) provides a reference point. South is up.

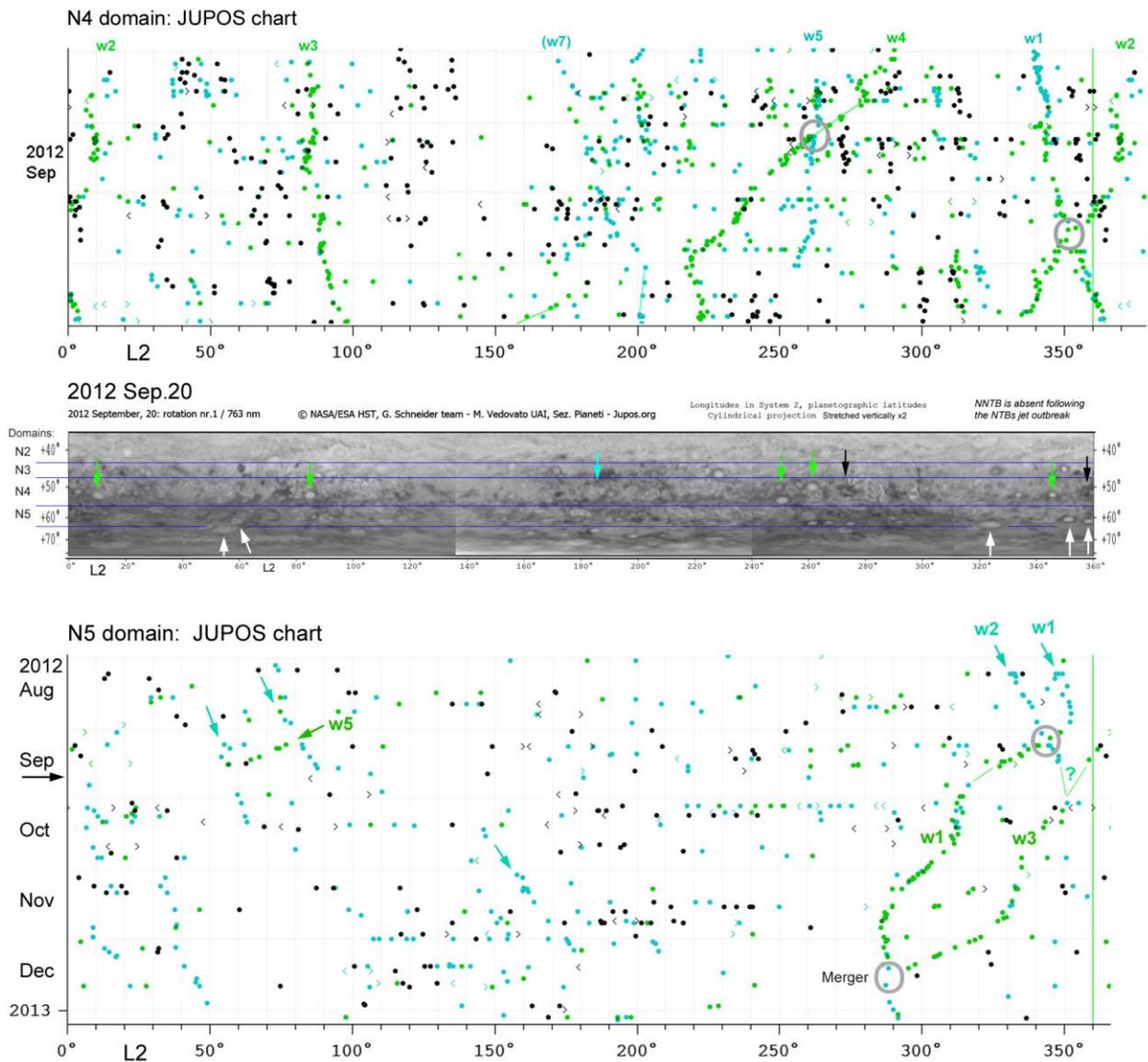


Figure 10. Hubble map from 2012 Sep.20 [adapted from ref.24] aligned with JUPOS charts of N4 and N5 domains [excerpts from Appendix 3]. To align with the JUPOS charts, the map is shown with south up. Latitudes of the prograde jets are marked. Arrows mark spots which can be tracked on the JUPOS charts (green, cyan and black for N4; white for N5).

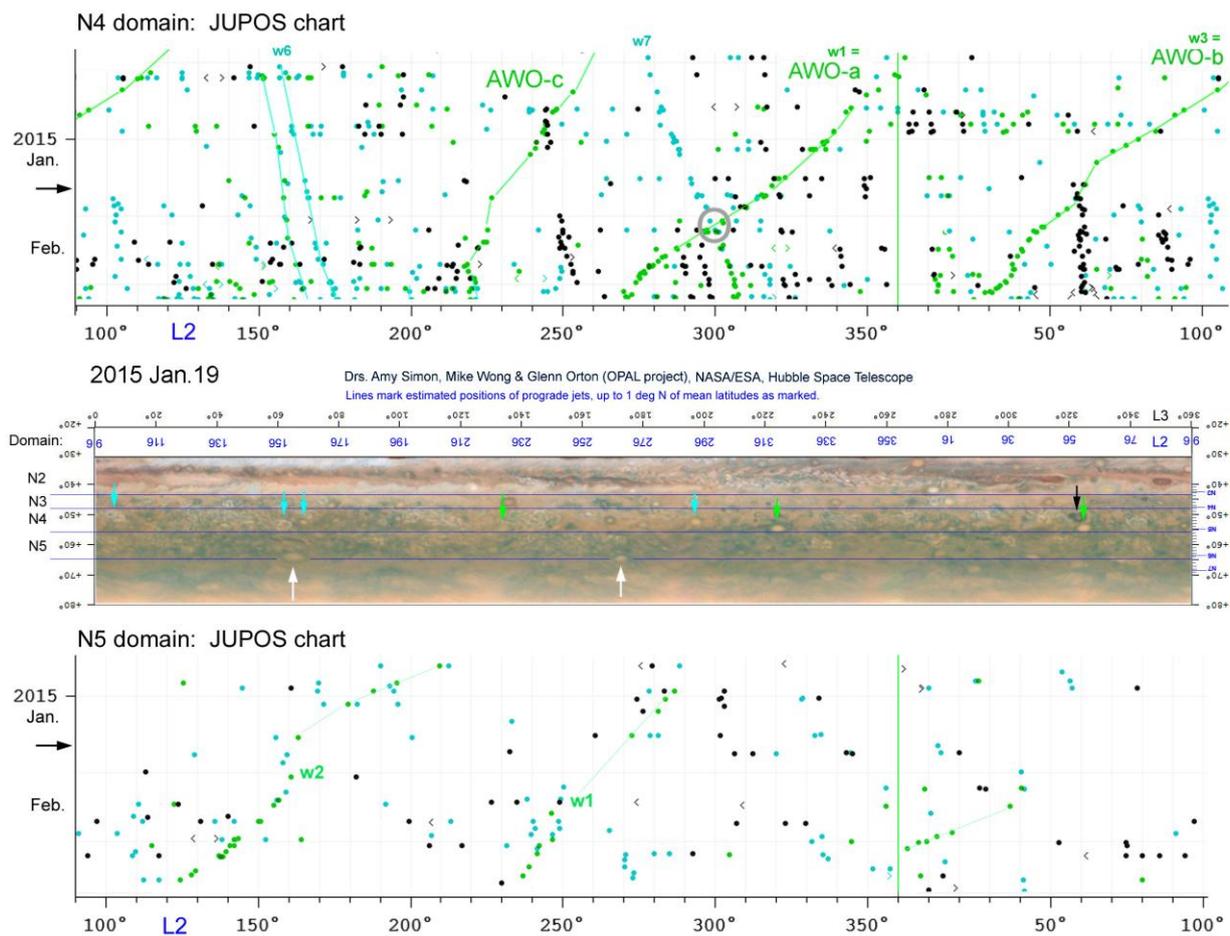


Figure 11. Hubble map from 2015 Jan. 19 [adapted from refs. 25 & 26], aligned with JUPOS charts of N4 and N5 domains, as in Fig. 10. (The latitude scale was fitted to this map approximately and appears to be ~1 deg too low by comparison with the visible jets.)

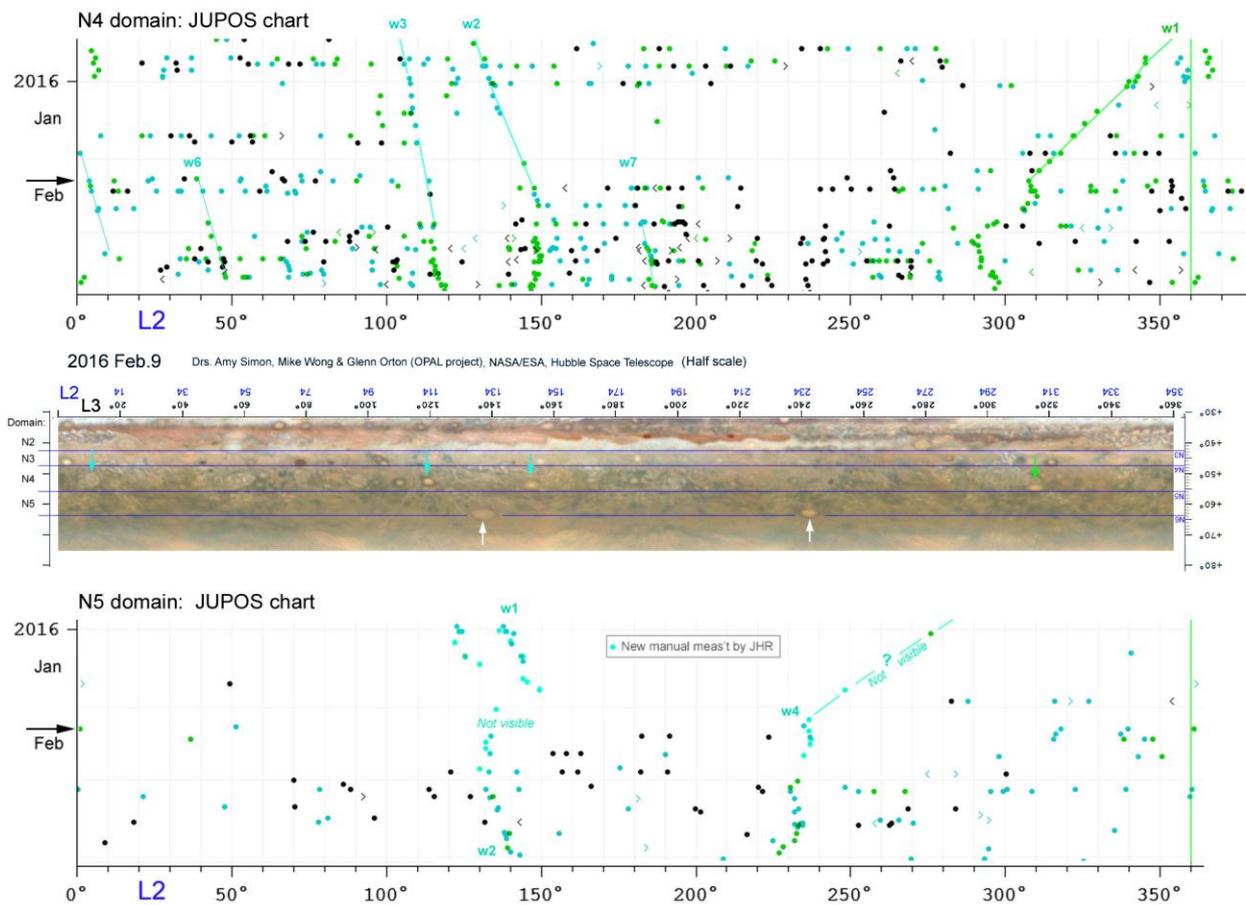


Figure 12. Hubble map from 2016 Feb.9 [adapted from ref.26], aligned with JUPOS charts of N4 and N5 domains, as in Fig.10.