

Influence of Jupiter's South Equatorial Disturbance on jet-stream speed

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A report of the Jupiter Section.

Supplementary On-line Material
(Table 2, Fig.2, Fig.8b)

Table 2. Speeds of SEBn features, 1999-2005

This table lists the observed drift rates for the SED main complex, and for small spots on SEBn in each longitude sector, for each apparition from 1999 to 2005, and for Voyager (1979) and Cassini (2000). The drift rates for the small spots are all plotted in Figure 4. Latitudes and uncertainties are also tabulated.

Apparition	Features	Small spots:								Main complex:	
		Distance E of SED	-DL1 (deg/mth)	+/-	u (m/s)	+/-	n	Lat. (deg.S)	+/- (SD)	<DL1> (deg/mth)	<u> (m/s)
1999/2000	Ranges of spots	0-45	0-30	10	105.5-119.8	5	6	6.6	0.6	33	89.8
		60-270	35-53	3-20	122.2-130.8	1.5-10	12	7.1	0.8	(+/-2, var.)	
2000/2001	Ranges of spots	40-110	41-58	5	125.1-133.2	2.5	5	(7.5)		37	87.8
	Single spots	30-160	41	2	125.1	1	3	(7.5)		(+/-2, var.)	
		60-130	74	3	140.8	1.5	2	(7.5)			
		110-260	85	2	146.1	1	2	(7.5)			
2001/02	Ranges of spots	30-170	50-75	5	129.4-141.3	2.5	19	7.6	0.3	37 -> 33	87.8
	Single spots	150-200	100	6	153.3	3	1	7.4	0.2	(+/-2, var.)	
		200-310	114	6	159.9	3	1	7.4	0.4		
2002/03	Long-lived bands	all	106	4	156.1	2	bands	7.2	0.6	27.5	92.4
										(+/-0.6)	
2004	Ranges of spots	5-60	31-48	2-5	120.3-128.4	1-2.5	22	7.4	0.6	25	93.6
	Single spots	40-60	50	3	129.4	1.5	2	7.1	0.6	(+/-2, var.)	
		50-90	71	3	139.4	1.5	2	7.2	0.4		
		80-160	76	3	141.8	1.5	4	7.2	0.3		
		135-205	95	4	150.9	2	3	7.4	0.6		
		260-280	66	9	137.0	4.5	2	7.3	0.5		
		280-310	104	5	155.2	2.5	1	7.5	0.4		
	Long-lived band	all	104	2	155.2	1	band	7.3	0.6		
2005	Long-lived bands	all	104	4	155.2	2	bands	7.2	0.5	26	93.1
	Range for spots	all	47-63	3	128.0-135.6	1.5	10	7.2	0.1*	(+/-0.4)	
Voyager 1979	(Maxworthy, 1985)	3-10	30.4		120		1	7.5		27	92.5
		331-353	118.4		162		7	7.2			
Cassini 2000	(this paper)	6-40	23	9	116.4	4.5	3	n.d.		39	87
		30-130	41-55	6	124.9-131.5	3	11				
		110-140	63.5	9	135.8	4.5	1				
		130-170	70-82	8	138.8-144.7	4	4				
		330-350	76	7	141.7	3.5	3				

Footnotes to Table 2:

This table lists the drift rates observed for small dark spots or projections (the chevrons) at the SEBn/EZs boundary, and for small white spots between them. Drift rates are given for single spots (or small groups), for ranges of longitude which contained multiple spots moving with similar speeds, and for long-lived rapidly-moving bands of spots. The last two columns give the drift rate for the SED itself (the main complex in 1999-2006 or the great white spot in 1979). The table does not include larger, slower-moving blue-grey patches in EZ(S) that were observed east of the main complex in 1999-2001; these apparently represented secondary disturbances or waves.

Observed drift rates are given as *DLI* (change in System I longitude per 30 days; negative). Wind speed in System III (m/s) is calculated as: $u = (221 - DLI) / 2.0945$. All conversions assume latitude 7.2°S. Uncertainties in *DLI* and *u* represent the estimated range of acceptable fits to the data. Where a range of drift rates is given, this is the observed range, greater than the uncertainty of the measurements.

Drift rates for Cassini data were derived as described in the text. Uncertainties for Cassini include the uncertainties in fitting individual spots, which are similar to those for ground-based measurements as they represent measurements of spots over similar intervals, plus a systematic uncertainty of ± 3 deg/month (1.5 m/s) in fitting the longitude scale.

Latitudes (zenographic) are given for dark features only. The quoted uncertainty in latitude is the standard deviation of the measurements (except: * SD of means for multiple spots). Latitudes measured for the associated small white spots were slightly lower: 6.2°S $\pm 0.3^\circ$ (1999/2000), 6.2°S $\pm 0.5^\circ$ (2001/02), 6.9°S $\pm 0.6^\circ$ (2004), 6.7°S $\pm 0.4^\circ$ (2005). In 2000/01, individual spot latitudes were not measured but they were projecting north from the SEBn edge at 8°S.

Figure 2 [BELOW]. Longitude charts showing the persistence of the SED, 2000-2006.

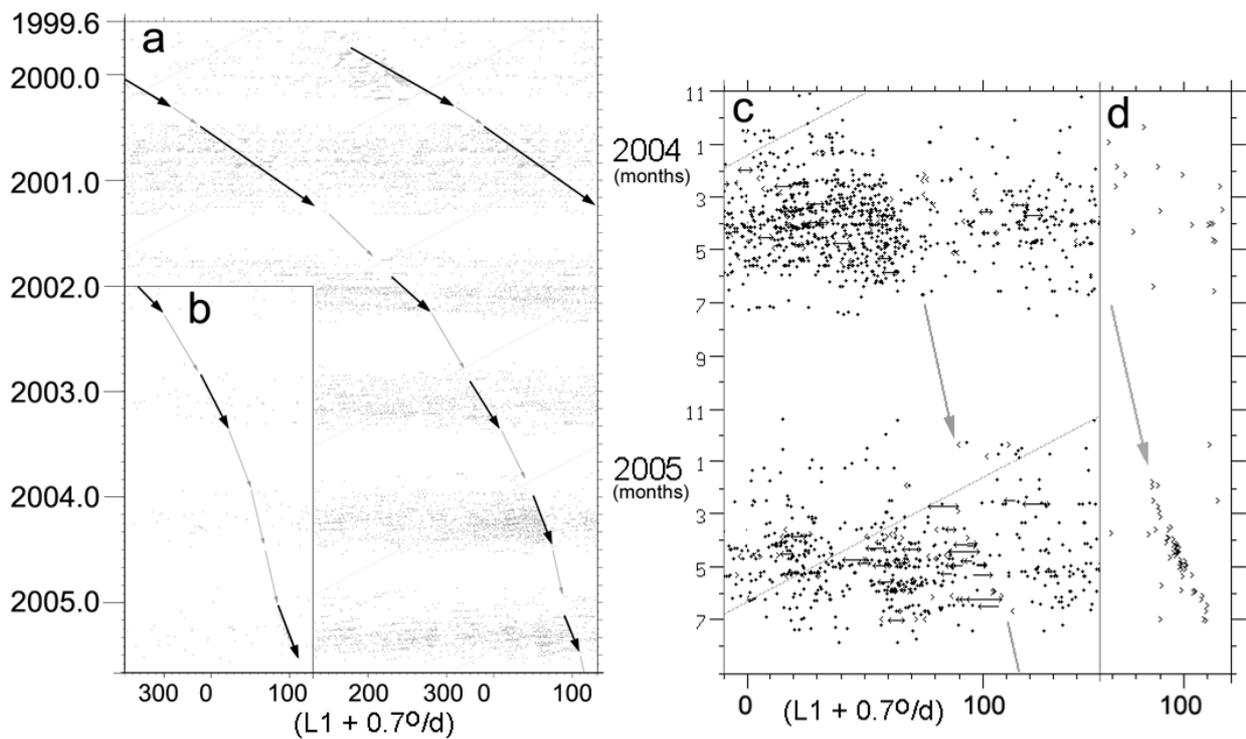
(a) The track of the SED (main complex) is marked by arrows: black where distinct, grey where indistinct or interpolated. The grey background is a reduced-scale longitude chart of all dark spots at latitudes 5.0 to 8.0°S. The SED (main complex) marks the interface between a dense area of points to the left (east) and a sparse area to the right (west).

(b) Longitude chart of the west ends of dark streaks in EZ(S), latitudes 3.0 to 6.0 °S, with same scales. When the SED is indistinct in (a), it is marked by a distinct track in (b).

(c,d) Full-resolution portions of charts (a) and (b) respectively. In 2004 the SED was distinct as an interface on the chart of SEBn dark spots (a,c); in 2005, instead, it was represented by a streak in EZ(S) (b,d).

In all panels, longitude scale moves at +0.7°/day in System I (-6.66°/day in System III). Diagonal lines indicate L1=0. (In all figures with drift charts, longitude increases to the right and time increases downwards, marked in months.)

[NEXT SHEET]: A full-resolution version of the whole chart (Supplementary On-line Figure 2)



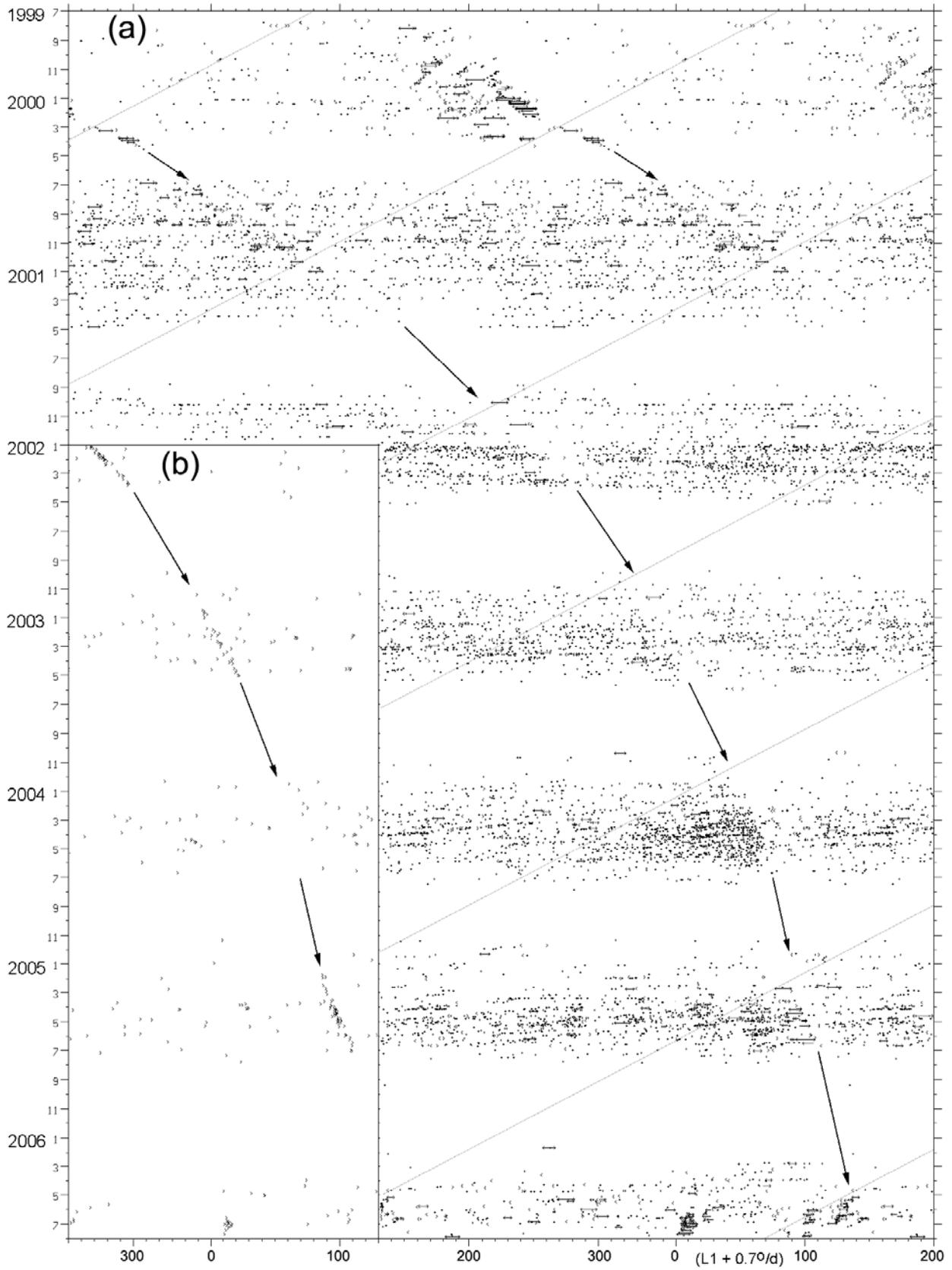


Figure 8 [BELOW]. Data in 2005.

Main chart: Longitude chart of dark spots at latitudes 5.0 to 8.0°S. Time scale is marked in months. Longitude scale moves at $-2.0^\circ/\text{day}$ in System I. Diagonal lines indicate $L1=0$ (dotted line) and the track of the SED (grey line). Note several rapidly-moving bands (diagonal down to the left: $DL1 = -3.5^\circ/\text{day}$; 155 m/s; large arrows indicate gaps between them), but the individual spots in them move more slowly (near-vertical tracks, indicated by small arrows: 128-136 m/s). *Inset at right* shows three such tracks at expanded scale. *Inset at left* shows one such cluster of chevrons on 2005 April 30 (D. Peach: red + green channels).

Below: A series of these strip-maps in colour showing the motion of the cluster at ~ -2.6 to $-2.0^\circ/\text{day}$, within a band of activity that was moving at $\sim -3.5^\circ/\text{day}$, (*Supplementary On-line Figure 8b*).

