

Jupiter in 2021/22, Report no.8: GRS and SEB

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Figures:

(North is up in all figures, and drift charts are plotted accordingly with longitude increasing to the left)

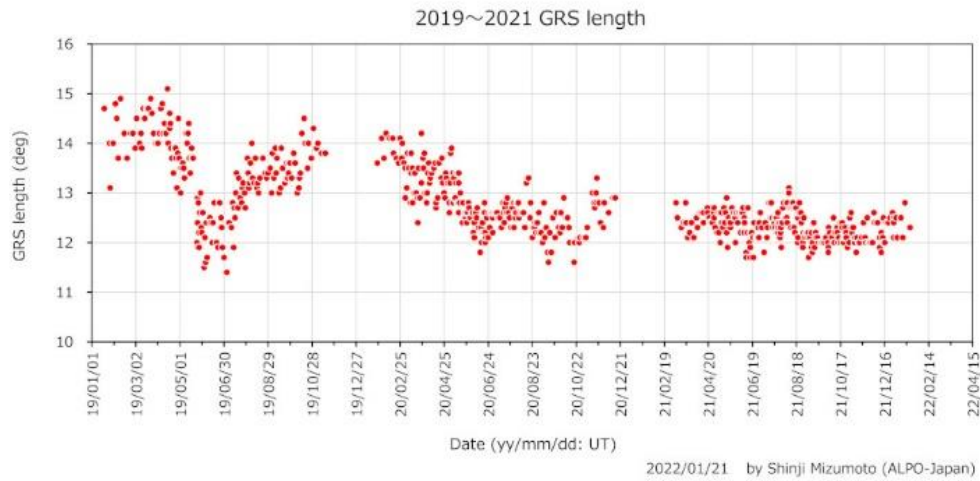


Figure 1. Chart of the length of the GRS, 2019-2021.

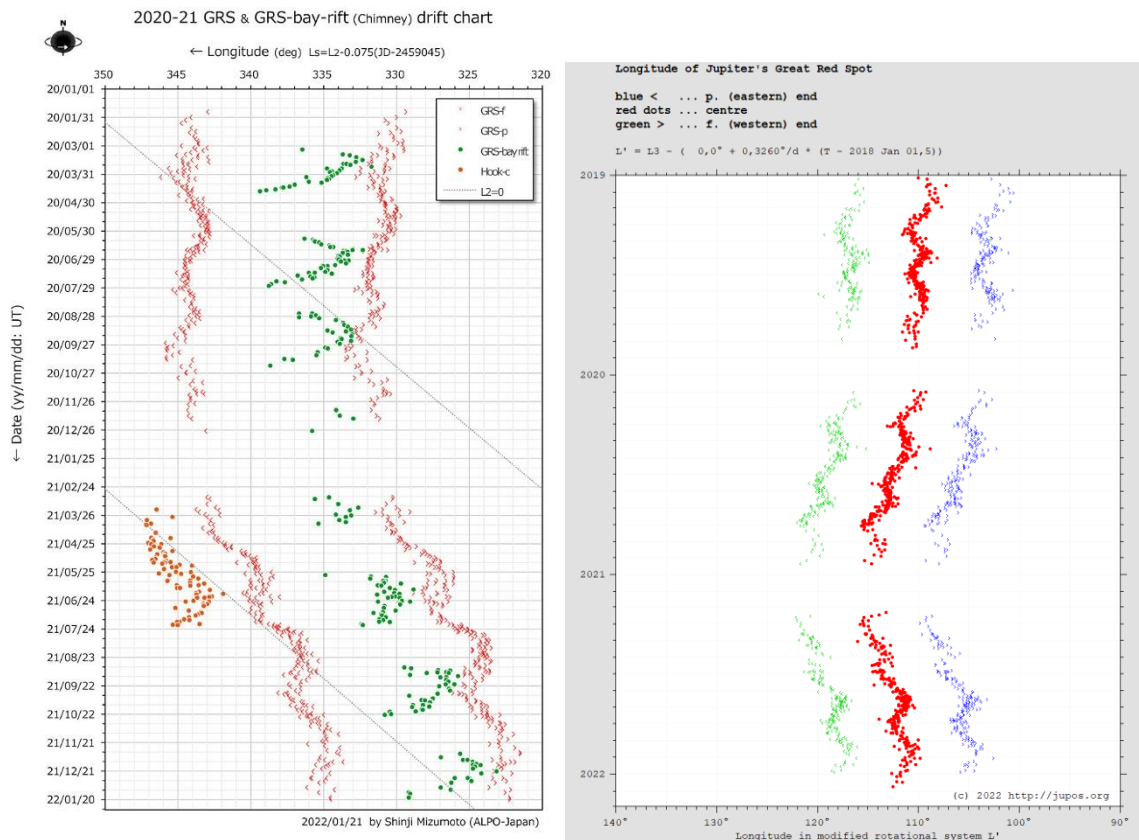


Figure 2. Charts of the longitude of the GRS, in longitude systems chosen to display the changes in its motion. (A) From ALPO-Japan: $L_2 + 2.25 \text{ deg}/30\text{d}$. (B) From JUPOS: $L_2 + 1.8 \text{ deg}/30\text{d}$.

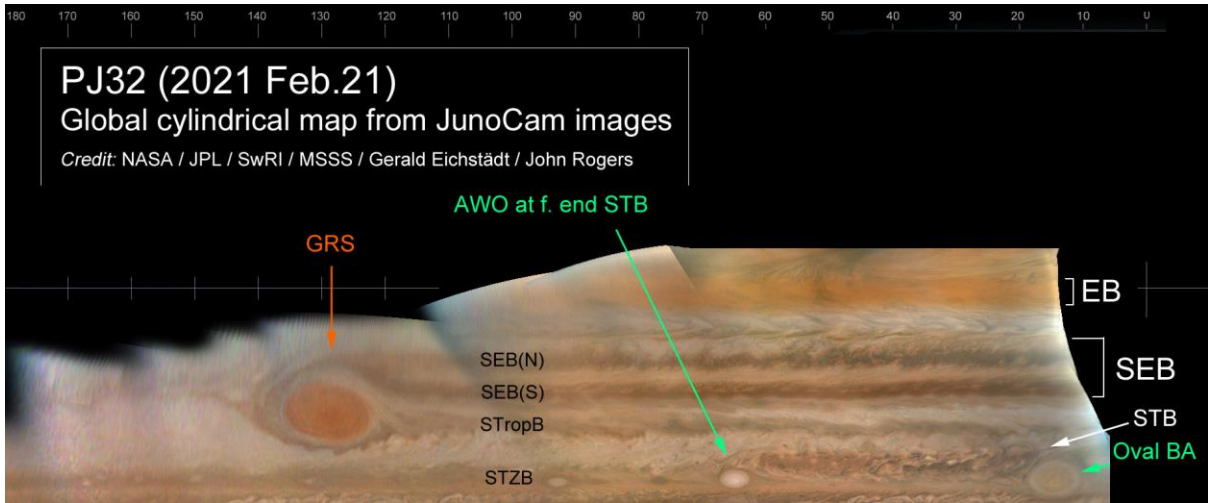


Figure 3. Map of the GRS region from JunoCam at PJ32. (This is part of Fig.6 from our report on the PJ32 images. JunoCam has not had a good view of the GRS since then.)

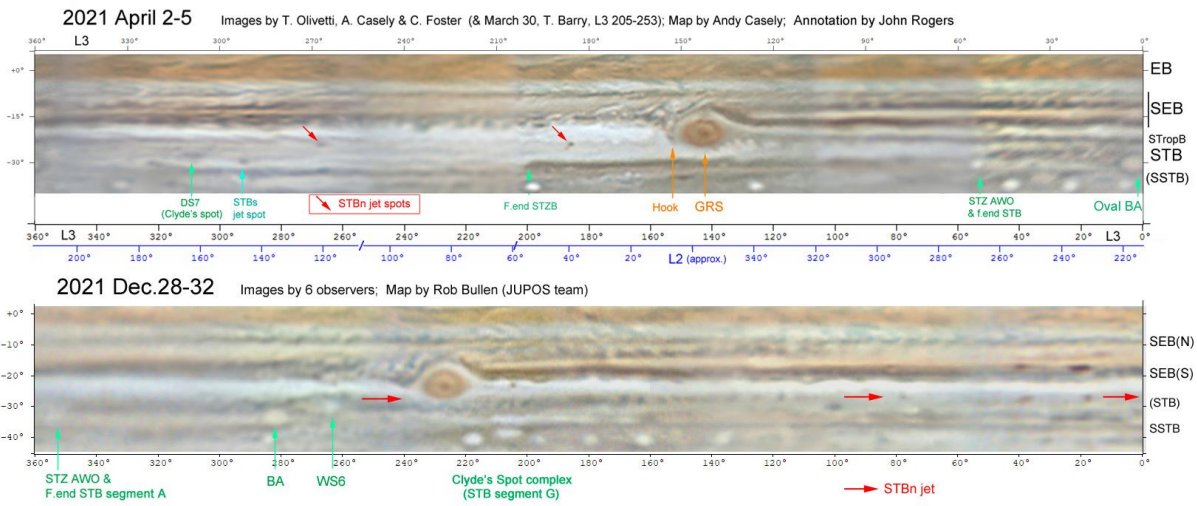


Figure 4. A pair of ground-based maps from early and late in the apparition, with features of the S. Temperate domain and STBn jet labelled.

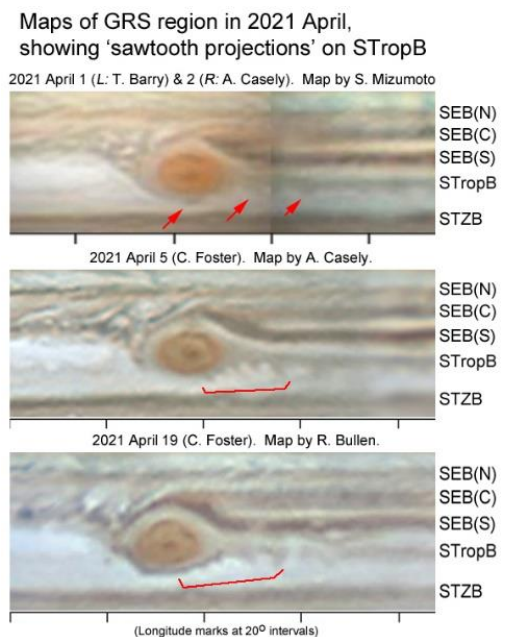


Figure 5. Maps in 2021 April, showing a prominent but short-lived 'sawtooth' pattern on the STropB S edge p. the GRS. See Fig.9 for another example.

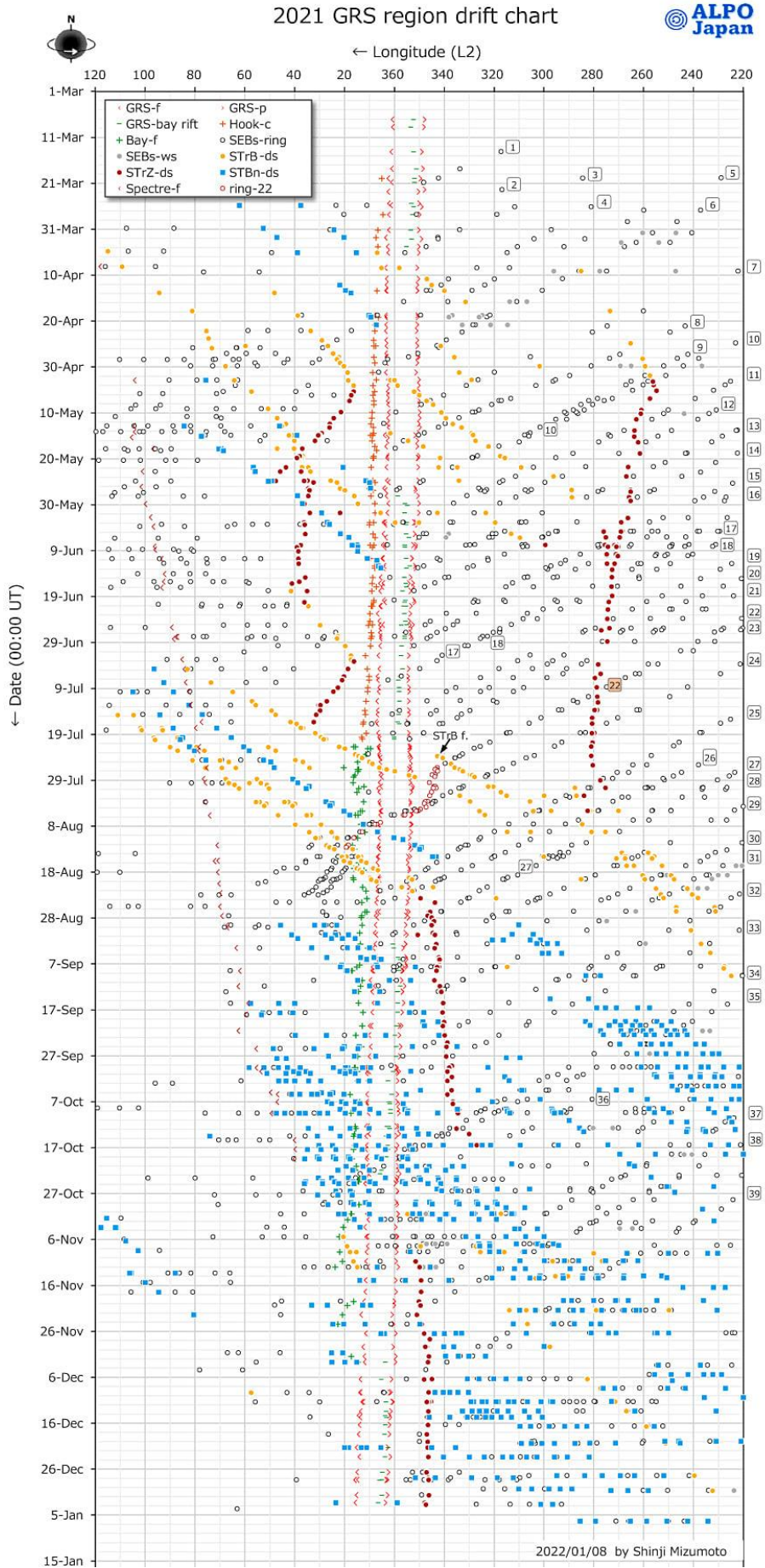


Figure 6.

Figure 7. A reddish flake at the f. end of the GRS on April 18, which is much less evident 9 hours later. Note the anticlockwise internal rotation of the GRS. (Figure by Niall MacNeill.)

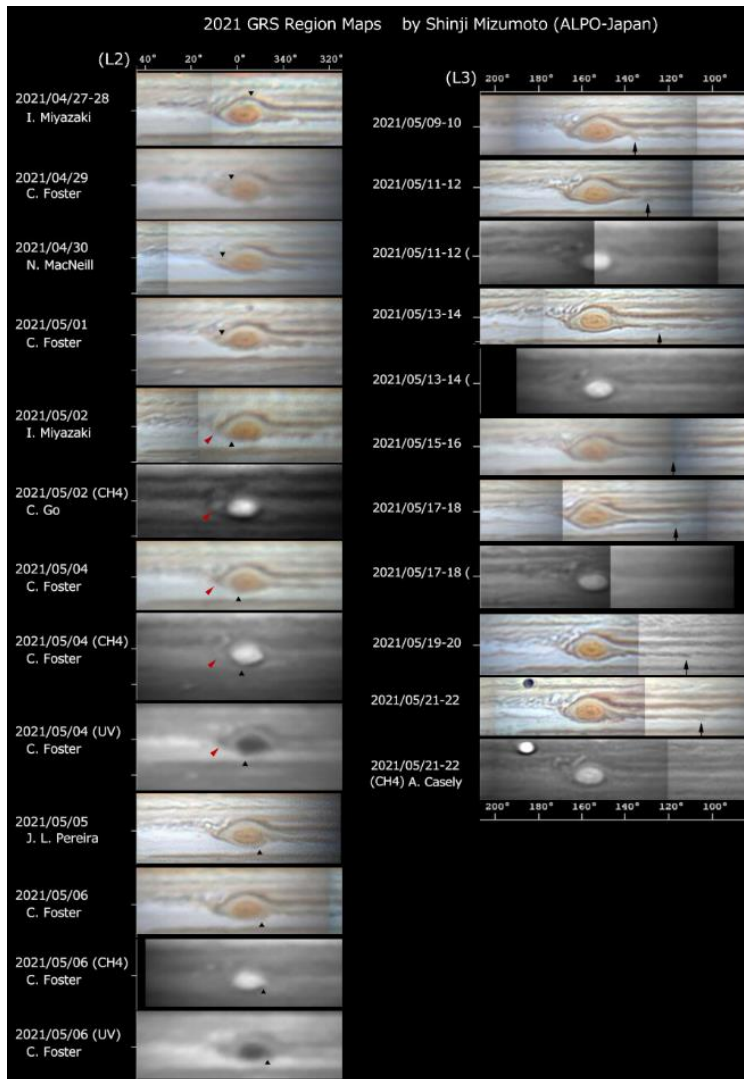
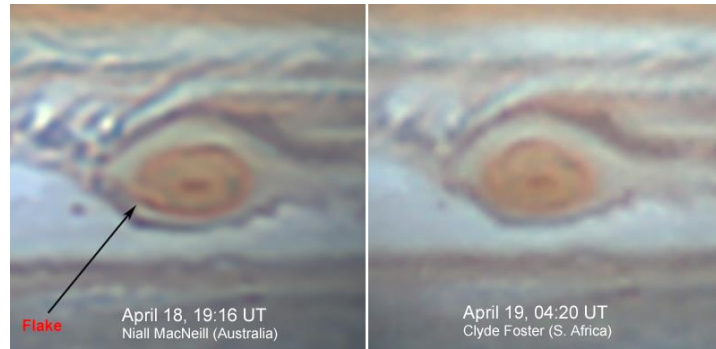


Figure 8. Excerpts from the comprehensive set of maps by Mizumoto, showing the origin and evolution of a flake from the GRS from April 27 into May. (See Fig.9 for original versions of some of these images.)

A SEBs ring entered the RSH on April 26 and generated a dark ‘bridge’ on April 30 which Niall MacNeill recognised as a reddish methane-bright flake (black arrowhead); it was also methane-bright on May 2 (dark red arrowhead). This feature also came round the S edge of the GRS to re-emerge at the p. end as a small reddish methane-bright flake on May 6 (C. Foster’s images). This became a large dark grey-brown spot prograding on the S edge of the STropB on May 7-22, but its colour faded and it was not methane-bright. On May 6-7, it was briefly preceded by a wave-like pattern similar to Fig.5 (see Fig.9). A patch of more strongly red material remained in the ‘wake’ just f. the Hook – but this was already there on April 29 (Fig.9) so it was unrelated to this flake.

The remaining images are not reproduced here as they are large compilations that need to be viewed at high resolution. All are in the accompanying ZIP file.

Figure 9. Some RGB, CH₄ & UV images from April 29 into May, showing higher resolution than the maps in [Fig.8](#).

Figure 10. Another example of arrival of a SEBs ring, in early July without triggering a flake.

Figure 11. Excerpts from maps, July 11-28, showing the entry of two SEBs rings (red arrowheads) into the RSH, breakup of the Hook, detachment of the STropB (thin yellow arrow), and abrupt halt of the next SEBs ring (black arrow). See text for more details. Continued in [Fig.12](#).

Figure 12. The map series continued: July 29—Aug.14.

Figure 13. Set of v-hi-res RGB images in Oct., including the arrival of a pair of SEBs rings on Oct.17-18.

Figure 14. Set of RGB and CH₄ images, Oct.22-28, CH₄ images. A small reddish, methane-bright flake was visible on Oct.22-24, though not thereafter.

Appendix 1:

>> Mizumoto's reports on the Hook and the associated phenomena resembling a Circulating Current: [j210718](#); [j220113r](#); [j220108r](#)).

>> Mizumoto's *animation* of GRS region maps (July30-Aug16_slow): includes the SEBs spots moving thru the RSH, & STB outbreak in spot 8.

>> Mizumoto's *animation* of GRS region maps (July-Dec) <[j21GRSanimL2n.htm](#)>.

>> Mizumoto's *animation* of the HST-OPAL maps (Sep.4) & Peach map (Sep.6), inc. the STB region of interest & GRS.
