☑ **Fact-Checked Science**

EVIDENCE REVIEW · S0 NEWS RESEARCH NOTE

S0's storm note: exact quotes, an 'anomaly' that is the storm, Florida's aurora unsupported

S0 News's research note 006 reviews what was published about the geomagnetic storm of March 23–24, 2023: a faint solar eruption that forecasters missed, a paper that ranks the disturbance the strongest "magnetic anomaly" in six years, a photograph of a red glow from Florida, and radio scintillation the same night [1 Opening]. Its quotations are exact, and its account of the storm matches its sources [4][5]. The "anomaly" is the storm itself, taken from NOAA's notice [7 p. 61]; the field was back at its earlier level in five days, and the dipole's weakening, which had been speeding up since 2019–2020, levelled off within months of the storm (our analysis) [13][16]. By its stars the Florida photograph looks south-west, where the storm's aurora could not stand (our analysis) [9], and S0's special report turns the ranking into "a major acceleration event in the ongoing magnetic pole shift", which neither the note nor the paper says [3 00:04:07–00:04:21].

By Fact-Checked Science · Published November 11, 2026

OUR ANALYSIS marks our own reasoning and calculations: the storm's rank among other storms; the recovery of the Dst index and the dipole's pace in CHAOS-8.7; where the Florida photograph's labelled objects lay in the sky and where auroral light could stand; the search for a second Florida record; and our reading of what the note, its sources and S0's special report do and don't say. The verdicts are our assessment. Everything else comes from the numbered sources. For the note [1], locators are its own section numbers; for the report [3], times in the video. nT is the nanotesla, the unit of field strength. Kp, from 0 to 9, and Dst, in nT and more negative in a stronger storm, are standard indices of geomagnetic storms; NOAA's scale runs from G1 to G5.

The note quotes its sources exactly; its "magnetic anomaly" is the storm itself, its Florida aurora rests on a photograph of the south-western sky, and the report misreads it

OUR ASSESSMENT

G4

the level the storm reached on NOAA's five-step scale, at 04:04 UTC on March 24, 2023; NOAA's watch had predicted G2 for that day [6][15]

5 days

for the disturbance of the field, as the Dst index measures it, to return from −163 nT to its level before the storm (our analysis) [13]

South-west

where the Florida photograph looks, by its stars; light from the storm's aurora could stand above the horizon only between north-west and north-east (our analysis) [9][21 Table 2]

THE CLAIMS

TRUE

"'Stealth' and 'missed forecast' are thus published findings, not interpretations introduced here."

The note, on the storm and its solar source [1 §2]

They are. Teng and colleagues traced the storm to a faint eruption on the Sun on March 19, 2023, which forecasters did not flag [4 Abstract]. Every quotation and number the note takes from that paper, from NOAA's two notices and from Kyoto's tables is as the sources give it [4][5] [6][13]. NOAA's own log adds a detail: a watch for G2 was out for March 24, and the storm reached G4 [15]. See section 2.

PARTLY TRUE

"Simonenko (2024) ranks the 23 March 2023 disturbance as the 'strongest (during the last 6 years) magnetic anomaly,' citing NOAA's G3 notice."

Simonenko's ranking, as the note relays it [1 §3]

The note relays it faithfully: the quotation is exact [7 Abstract], and the "anomaly" is the storm, since the paper's only source for it is NOAA's notice of G3 storming [7 p. 61][5]. The ranking itself is partly right (our analysis). On Kp and on NOAA's own scale the storm was the strongest since September 2017, five and a half years earlier. But that September storm lies inside the six years: it reached Kp 8+ against 8o, and the same G4 [14][15]. On the ring current two indices disagree [13][16]. See section 3.

UNSUPPORTED

"The strongest magnetic anomaly in six years and the first Florida aurora of Solar Cycle 25 fall on one night."

The note, in its own voice [1 §3]

The Florida record is one long exposure from Chiefland, which the note reports as graded "Medium confidence, camera-only" [1 §4]. Its photographer first read the glow as airglow, the upper air's own faint light [9]. By its stars the frame runs from south-east through south and west to west-north-west, with no northern sky: nothing in it lies north of about azimuth 305° [9]; light from the storm's auroral oval could have stood above the horizon only between north-west and north-east (our analysis) [21 Table 2]. We found no second record [18]. Faint aurora low in the north was possible that night; this photograph doesn't look there. See section 5.

TRUE

"Gomez Socola et al. (2025) document an extraordinary L-band scintillation event during the same night in the American sector."

The note, on a 2025 paper [1 §5]

The paper's abstract says so: intense flickering of satellite-navigation signals from Peru to Texas, caused by depleted patches of the ionosphere that reached middle latitudes [12 Abstract]. The note says, rightly, that these are radio observations, "not optical verification of the Florida glow" [1 §5]. We have since read the whole paper: it bears the abstract out, and it reports no optical observation [12 §2]. See section 6.

PARTLY TRUE

"It presents published findings and interpretations for scientists to ponder, with no new claims, measurements, statistics, or mechanism determination."

The note, of itself [1 Appendix]

No new measurement, statistic or mechanism: true, and it is careful: G4 not G5, Dst not SYM-H, a photograph not a sighting [1 §5]. No new claim: not quite. It speaks in its own voice when it sets "the strongest magnetic anomaly in six years" beside "the first Florida aurora" as two things on one night [1 §3]. That is one storm described twice, and a record graded Medium stated as fact. And it doesn't say what Simonenko's paper argues: that the pull of the planets and the Sun on Earth's inner core caused the disturbance [7 Abstract]. See section 7.

MISREAD

"that was the day that Russian scientist Sergey Seenko logged a titanic magnetic anomaly, a major acceleration event in the ongoing magnetic pole shift. And what I mean by that is that is the acceleration event beginning."

S0's special report [3 00:04:07–00:04:21], after "But then again, those weren't coinciding with the most extreme magnetic anomaly that we've seen." [3 00:03:42–00:03:46] "Seenko" is the automatic transcript's rendering of Simonenko

Neither the note nor Simonenko says so. Simonenko measured nothing: both papers take the event from NOAA's storm notice [7 p. 61][8 §3.1]. The 2024 paper does speak of a possible reversal, begun in 2007, and of "intensifications" of magnetic processes; nothing in either begins or speeds up in 2023, and "acceler" and "pole shift" appear in neither (our search) [7 Abstract]. The field was back at its level before the storm in five days [13], and the dipole's weakening, which had been speeding up since 2019–2020, has kept a level pace since mid-2023 [16] (our analysis). See sections 4 and 8.

1 · WHAT THE NOTE IS

A literature review of one storm: twelve references, one borrowed chart, no data of its own

S0 News's research note 006, credited to an "internal GrokBot Team 006", sets side by side what its sources say about the geomagnetic storm of March 23–24, 2023 [1 Opening]. S0's special report of November 11, 2026, linked it and drew on it [1][3]. Our review of the report covers the rest of the video.

In the note's words

The note's locators here are its own section numbers, with Opening for its first paragraph and Appendix for its last part.

> *"This literature review places those accounts together while keeping their evidence and interpretations distinct."*
>
> The note [1 Opening]

> *"Read together without constructing coincidence into a new causal claim."*
>
> The note [1 §5]

> *"This internally reviewed research note is a literature review, not a peer-reviewed journal article."*
>
> The note [1 Appendix]

What the note reports

A severe storm, not a large flare, driven by a faint eruption that forecasters missed [1 §1][1 §2]. A paper by S. V. Simonenko that ranks the disturbance the strongest "magnetic anomaly" in six years [1 §3]. One photograph of a red glow from Chiefland, Florida, the same night [1 §4]. And a paper on radio scintillation across the Americas that night [1 §5]. Its one figure is S0 News's chart of the lowest Dst of each storm with a Florida record, which our check of research note 004 examines [1 Figure 1].

What we could read

The note, in full, and eleven of its twelve references. The twelfth, an internal inventory, sits in a "source pack" on Google Drive, which asked for a sign-in; we don't sign in [2]. The scintillation paper the note read as its abstract only; we have since read it in full, from a copy the site's owner downloaded [12]. The note states no licence, so we link it and quote from it; none of its text or its figure is reproduced. It has not been peer reviewed, and says so [1 Appendix].

The note's twelve references, and what we read of each

Scroll sideways to see the whole table →

NO.	WHAT IT IS	WHAT THE NOTE TAKES FROM IT	WHAT WE READ
[1]	Teng and colleagues, *Nature Communications*, 2024 [4]	The storm's solar source, its numbers, the missed forecast	Full text
[2], [3]	NOAA's notices of March 23 and 24, 2023 [5][6]	G3, then G4; "stronger than anticipated"	Both, in full
[4], [5]	Two papers by S. V. Simonenko, 2024 and 2023 [7][8]	"strongest (during the last 6 years) magnetic anomaly"	Both, in full
[6]	A photographer's entry in Spaceweather.com's gallery [9]	The Chiefland exposure	The entry and its photograph
[7], [9]	Kyoto's Dst tables for March 2023 and March 1989 [13]	−163 nT and −589 nT	Both tables
[8]	S0 News's internal inventory of Florida records	"Medium confidence, camera-only"	Not readable [2]; note 004's public table carries the same row
[10]	Spaceweather.com, March 27, 2023 [10]	Aurora "most likely", airglow the alternative	Full page
[11]	Newsweek, March 29, 2023 [11]	A retelling of the gallery entry	Full article
[12]	Gomez Socola and colleagues, *Space Weather*, 2025 [12]	Radio scintillation that night	Full text, from a copy the site's owner downloaded

2 · THE STORM AND ITS SOURCE

A severe storm from an eruption nobody flagged: the note has it as its sources do

"This was a major geomagnetic storm, not a major solar flare" [1 §1]. On the storm, the note's source is a peer-reviewed paper in *Nature Communications* [4], and each of its statements checks against that paper, NOAA's notices and the index tables.

HIGHEST KP

8o

in one three-hour interval, 03–06 UT on March 24, 2023, in GFZ's definitive record; Kp runs from 0 to 9 [14]

LOWEST DST

−163 nT

in the hour from 02:00 UT on March 24, in Kyoto's provisional table; March 1989 reached −589 nT [13]

NOAA'S SCALE

G4

"Severe", the fourth of five steps, reached at 04:04 UTC on March 24; G3 had been reached at 14:49 UTC on March 23 [5][6]

What the paper found

Teng and colleagues traced the storm back to the Sun. On March 19, 2023, a long, low-density bundle of twisted magnetic field lying across the Sun's equator, a flux rope, erupted gently, with "weaker coronal emission and no chromospheric signs" [4 Abstract]. It produced a faint coronal mass ejection aimed at Earth, which was absent from one catalogue of ejections and listed in others only in parts [4 p. 5]. A second, clearer ejection followed it and was forecast to grant Earth a Kp of 2.0–4.5 at most [4 p. 6]. At Earth the first ejection's magnetic field pointed south at about 15 nT for more than ten hours, which is what drives a storm [4 p. 2].

What NOAA said at the time

"G3 (Strong) geomagnetic storming was observed at approximately 10:49 am EDT (1449 UTC) on 23 March. This was due primarily to stronger than anticipated CME influences" [5]. Then: "geomagnetic response escalated to the G4 (Severe) storm level on 24 March at 12:04 am EDT (24/0404 UTC)" [6]. The first notice went up at 16:59 UTC on March 23 and the second at 04:41 UTC on March 24.

The note's statements beside their sources

Scroll sideways to see the whole table →

WHAT	THE NOTE [1 §1][1 §2]	THE SOURCE
The eruption	A faint eruption of a trans-equatorial flux rope on March 19, with "weaker coronal emission and no chromospheric signs"	The same words; brightening bands develop after 17:00 UT on March 19 [4 Abstract][4 p. 4]
The field at Earth	"Bz near −15 nT for more than ten hours"	About −15 nT "for more than 10 h" [4 p. 2]
Dst and SYM-H, its one-minute counterpart	−163 nT and −170 nT, "different indices, not interchangeable"	−163 nT and −170 nT [4 p. 2]; Kyoto's table, −163 nT [13]
Kp	"Kp reaching 8 for three hours, corresponding to G4 (Severe), not G5"	"reaches 8 for 3 h and over 7 for 9 h" [4 p. 2]; GFZ, 8o in 03–06 UT on March 24 [14]
NOAA	G3 on March 23, then G4 on March 24; "stronger than anticipated CME influences"	The same levels, days and words [5][6]
The hour of the minimum	"the 24 March 02:00 UT hour-start bin (23 March, 8:00 p.m. MDT)"	Kyoto's provisional table: the hour from 02:00 to 03:00 UT on March 24, which is 8 p.m. Mountain time on March 23 [13]
March 1989	−589 nT, "Kyoto's final record"	−589 nT, in the hour from 01:00 UT on March 14, 1989 [13]
The forecast	"forecasts based on remote-sensing observations failed to predict it"	The same words [4 Abstract]; "the full-halo CME is not identified" [4 p. 5]
The second ejection	"predicted maximum Kp of 2.0–4.5"	"Predicted Maximum Kp = 2.0–4.5" [4 p. 6]

Our comparison. Page numbers are those of the paper's PDF. The two forecast records the paper cites for the second ejection are on a NASA server that didn't answer us, so that figure is checked against the paper alone.

OUR ANALYSIS

NOAA's archive of its own alerts fills in what "missed" means. On March 21, at 21:59 UTC, NOAA issued a watch predicting G2 for March 24; on March 22, at 16:53 UTC, it added G1 for March 23 [15]. What arrived was G3 on the 23rd and G4 on the 24th. So the eruption that mattered went unflagged, as the paper says, and the storm was forecast two steps too low, not unforeseen altogether. The archive also confirms the notices' times: an alert for a K-index of 7 with its threshold at 14:49 UTC on March 23, and one for a K-index of 8 at 04:04 UTC on March 24 [15].

3 · THE "MAGNETIC ANOMALY"

Simonenko's "anomaly" is the storm, taken from NOAA's notice; as a ranking it holds for five and a half years, not six

The note's third section rests on two papers by S. V. Simonenko, of the V. I. Il'ichev Pacific Oceanological Institute in Vladivostok [7][8]. We read both in full.

In the papers' words

Both are published under CC BY 4.0. The reference each gives for the event is NOAA's notice of G3 storming [5].

> *"it was observed the strongest (during the last 6 years) magnetic anomaly on 23 March 2023 AD"*
>
> Simonenko (2024) [7 Abstract]

> *"The strongest (during the last 6 years) magnetic anomaly observed on March 23, 2023 AD (according to the US Space Weather Prediction Center and National Oceanic and Atmospheric Administration)"*
>
> Simonenko (2023) [8 §3.1]

> *"the date March 2007 AD can be considered as the possible beginning of the geomagnetic reversal during the evaluated range (2007±2216) AD"*
>
> Simonenko (2024) [7 Abstract]

What the papers argue

The 2024 paper argues for a "cosmic (planetary and solar) energy gravitational origin" of "the maximal temporal intensifications of the global magnetic processes of the Earth", acting on Earth's "internal rigid core" [7 Abstract]. It sets the storm's date, March 23, beside a date computed from the planets' positions, "2023.26666666 AD (corresponding approximately to 7 April 2023 AD)", and calls the two in "fairly good agreement" [7 Abstract]. The 2023 paper makes the same argument for the strongest earthquakes of 2020–2023 and gives the storm one sentence [8 §3.1]. Neither mentions the coronal mass ejection that NOAA's notice, their own reference, names as the cause [5]; "solar wind" appears in neither (our search).

What "magnetic anomaly" means in them

The 2024 paper names three: rapid changes of the field near March 2007, for which it cites a study of Earth's core; a "strong magnetic anomaly" in Norway on January 6, 2020, for which it cites a web article; and March 23, 2023, for which it cites NOAA's storm notice [7 §3][7 p. 61]. In its own text the paper never uses the word "storm" (our search). On January 6, 2020, Kp peaked at 3+ and Dst stayed above −24 nT: a quiet day worldwide [14][13]. So the term covers a change in the core, a local report and a geomagnetic storm; it isn't a measured quantity.

A pole shift, an excursion, an acceleration?

The 2024 paper does discuss a reversal of the field: it dates a "possible beginning" to March 2007, in a range that runs to 2216, and holds that "the physical mechanism ... of the strongest geomagnetic anomalies and geomagnetic reversals is the same" [7 Abstract][7 p. 59]. It says nothing of 2023 beginning anything. A search of its full text finds "acceler" nowhere, "pole shift" nowhere, and "excursion" only in the titles of two references; the 2023 paper has none of the three words, nor "reversal" (our search) [7][8].

The journals

Prevention and Treatment of Natural Disasters calls itself "an international, peer-reviewed, open-access journal"; it began in 2022, and OpenAlex records 48 works in it [24]. The paper was received on February 1, 2024, and published on March 31 [7 p. 55]; it thanks "independent reviewers" [7 p. 60]. *Journal of Geoscience and Environment Protection* calls itself "an openly accessible journal published monthly"; OpenAlex records 2,180 works in it since 2013 [25]. The 2023 paper was received on June 24 and published on July 31 [8 p. 242]; its acknowledgements call the journal "this conference journal" [8 p. 253]. A search of the Directory of Open Access Journals returned neither journal [24][25].

As a ranking of storms

OUR ANALYSIS

We read "the last 6 years" the kinder way, as the six years before the storm, March 23, 2017, to March 23, 2023, and asked on which standard measures the storm was the strongest of them. The rules were fixed and hashed before we fetched the indices for this page, though we already knew, from our review of November 1, which two storms to set it against (section 10). On the highest three-hour Kp, the highest daily Ap and the highest 24-hour mean of ap, the storm of September 7–8, 2017, was stronger [14]. On NOAA's own alerts the two are level: a K-index of 8, which is G4, in September 2017 and in March 2023, and nothing higher between [15]. On Kyoto's Dst, the storm of August 26, 2018, went 13 nT lower [13]; on a second ring-current index, DTU's RC, March 2023 went 31 nT lower than August 2018 [16]. Counted from September 10, 2017, the storm leads on Kp, on the 24-hour mean and on NOAA's scale.

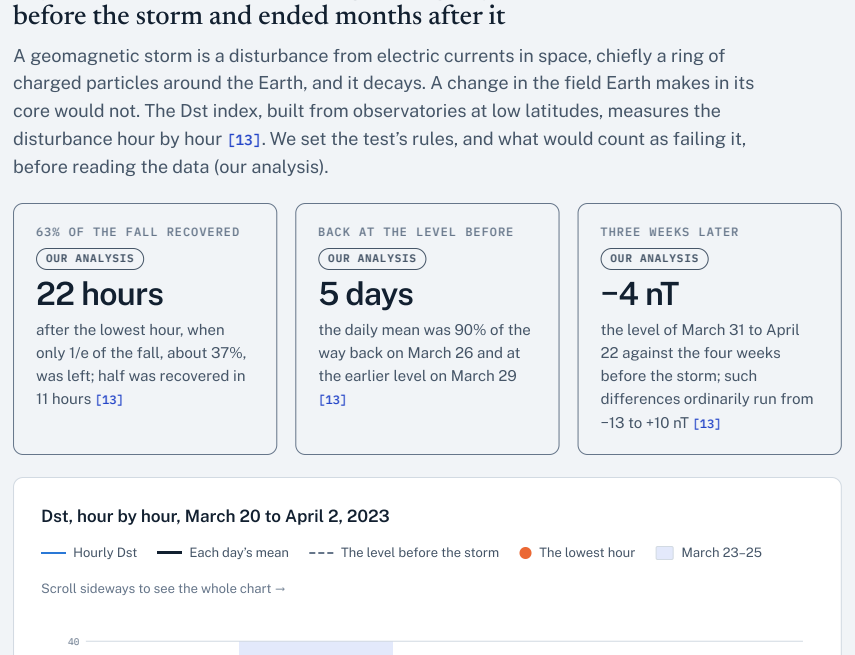
The ordinary explanation is at hand. News reports of March 24, 2023, called the storm the most intense in nearly six years [10 Mar. 24] or the most powerful in six [20], which fits a count from September 2017, the year a third report names [19]. NOAA's G3 notice, the papers' reference, carries no ranking, and G3 itself was nothing rare: NOAA alerted for a K-index of 7 or more on 11 other days, in 9 other storms, of those six years [15]. What made March 2023 stand out was the G4, which is in NOAA's second notice [6].

The storm against the six years before it, measure by measure

Scroll sideways to see the whole table →

MEASURE	THE STORM	SIX YEARS BEFORE, FROM MARCH 23, 2017	FROM SEPTEMBER 10, 2017	CYCLE 25 TO THE STORM, FROM DECEMBER 2019
Highest three-hour Kp [14]	8o	8+, Sept. 8, 2017: stronger	8−, Nov. 4, 2021: weaker	8−: weaker
Highest daily Ap [14]	73	106, Sept. 8, 2017: stronger	91, Feb. 27, 2023: stronger	91: stronger
Highest 24-hour mean of ap [14]	108.8	123.6, Sept. 7–8, 2017: stronger	93.5, Feb. 27, 2023: weaker	93.5: weaker
Lowest Dst, Kyoto [13]	−163 nT, provisional	−176 nT, Aug. 26, 2018, final: stronger	−176 nT: stronger	−132 nT, Feb. 27, 2023: weaker
Lowest RC, DTU [16]	−212 nT	−181 nT, Aug. 26, 2018: weaker	weaker	weaker
NOAA's highest alert [15]	K 8 (G4)	K 8 (G4), Sept. 7–8, 2017: equal	K 7 (G3): weaker	K 7 (G3): weaker

Our analysis. Each cell gives the most extreme value in the window and how it compares with the storm's. Kp, ap and Ap from GFZ, definitive [14]. Dst from Kyoto: final to December 2020, provisional after [13]. A provisional value is not final, and a gap of 13 nT between a provisional minimum and a final one is not a ranking; the RC row, added as a check before this file was read, is why we don't call a winner between March 2023 and August 2018 [16]. Among the 135 storms of the six years to March 2023 that reached Kp 5−, the storm ranks second by Kp, third by daily Ap and second by the 24-hour mean; among the 76 that reached −50 nT in Dst, second.



Every strong storm from March 2017 to October 2026

Our analysis. Top: the highest Kp of each of the 37 storms that reached Kp 7− (which is NOAA's G3) [14]. Bottom: the lowest Dst of each of the 31 storms that reached −100 nT [13]. Storms are runs of three-hour intervals at Kp 5− or more, or of hours at −50 nT or below, joined when 24 hours apart or less. Kp is definitive to October 31, 2026; Dst runs to September 2026, its last provisional month. Kp from GFZ, CC BY 4.0. Dst from the World Data Center for Geomagnetism, Kyoto: final and provisional values, used with acknowledgement of the Center and of the observatories. Since March 2023, six storms of this solar cycle have reached a higher Kp and seven a lower Dst.

4 · EARTH'S OWN FIELD

The field was back at its earlier level in five days, and the dipole's speeding-up began years before the storm and ended months after it

A geomagnetic storm is a disturbance from electric currents in space, chiefly a ring of charged particles around the Earth, and it decays. A change in the field Earth makes in its core would not. The Dst index, built from observatories at low latitudes, measures the disturbance hour by hour [13]. We set the test's rules, and what would count as failing it, before reading the data (our analysis).

63% OF THE FALL RECOVERED · OUR ANALYSIS

22 hours

after the lowest hour, when only 1/e of the fall, about 37%, was left; half was recovered in 11 hours [13]

BACK AT THE LEVEL BEFORE · OUR ANALYSIS

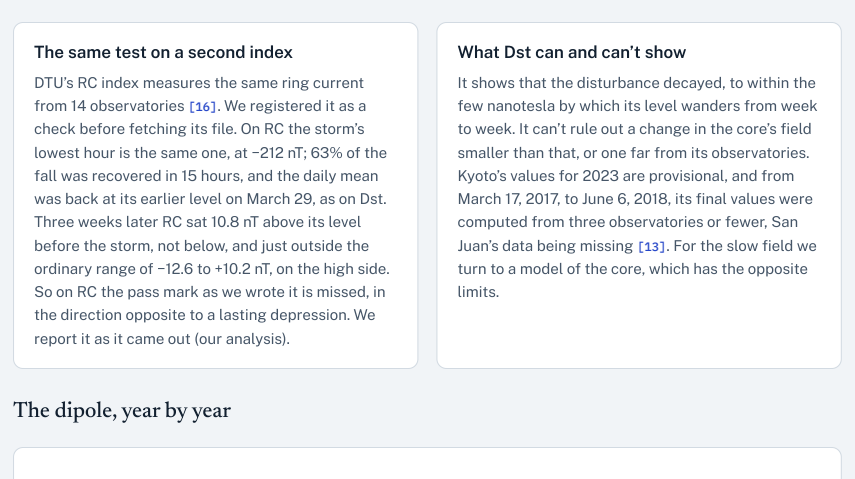
5 days

the daily mean was 90% of the way back on March 26 and at the earlier level on March 29 [13]

THREE WEEKS LATER · OUR ANALYSIS

−4 nT

the level of March 31 to April 22 against the four weeks before the storm; such differences ordinarily run from −13 to +10 nT [13]



Dst, hour by hour, March 20 to April 2, 2023

Our analysis of Kyoto's provisional Dst for March and April 2023 [13]: hourly values from the World Data Center for Geomagnetism, Kyoto, for scientific, non-commercial use, with acknowledgement of the Center and of the observatories that supply the data. The level before the storm is the median of the 27 days before March 23.

OUR ANALYSIS

The test that could have failed

If the storm had marked a lasting change in the field, the level afterwards would sit below the level before. Before the storm, the median of 27 days was −4 nT. Dst fell to −163 nT, a drop of 159 nT. From a week after the lowest hour to the day the next large storm began, March 31 to April 22, the median was −8 nT: 4 nT lower. For every one of 2,133 days in the six years before, we took the same difference; 95% of them lie between −13 and +10 nT. The storm's −4 nT is well inside, at the 18th percentile. The pass mark, fixed beforehand, was to lie inside that range, and it does [13].

The recovery was ordinary, too. Among the 31 storms since March 2017 that reached −100 nT, the time to recover 63% of the fall ran from 7 to 77 hours, with a median of 16, and the median time back to the earlier level was 6 days. March 2023 took 22 hours and 5 days [13]. Against the three days just before the storm, which stood 10 nT above the month's level, the daily mean took until April 18; both are in the hosted file. A third registered check, of the three months after against the three before, came out inside its range as well: 1.4 nT lower, where such differences run from −10 to +11.

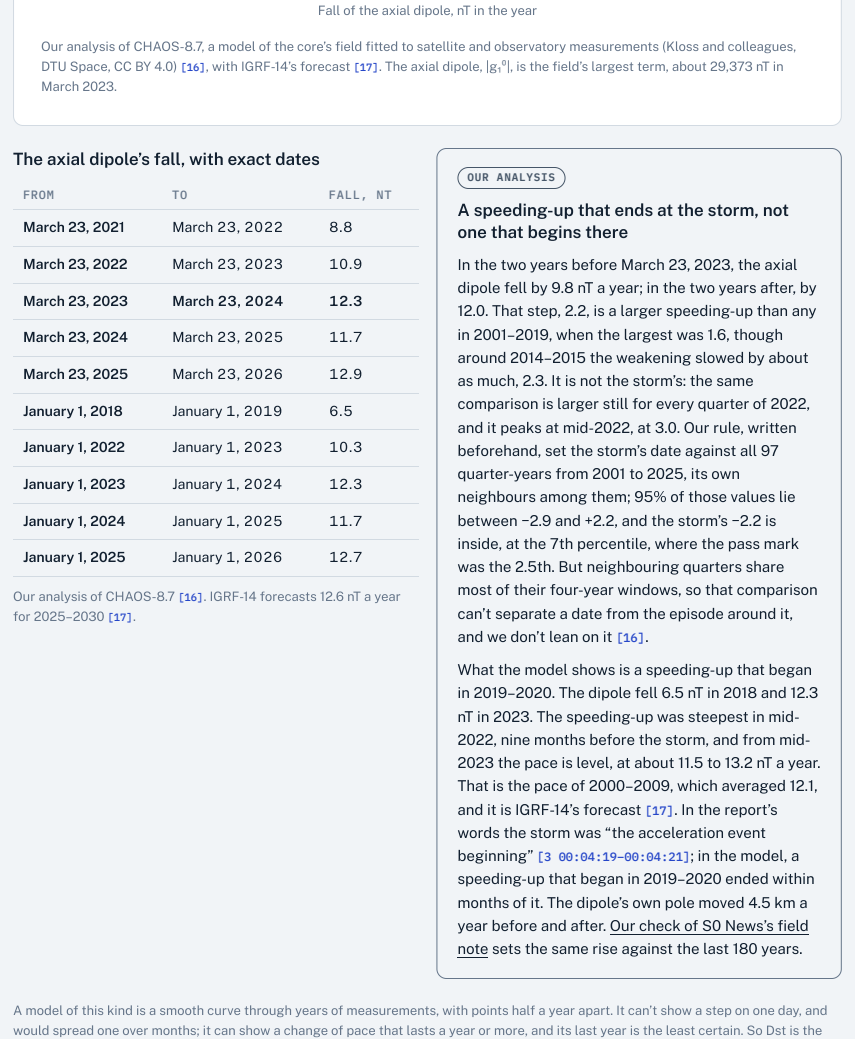
The same test on a second index

DTU's RC index measures the same ring current from 14 observatories [16]. We registered it as a check before fetching its file. On RC the storm's lowest hour is the same one, at −212 nT; 63% of the fall was recovered in 15 hours, and the daily mean was back at its earlier level on March 29, as on Dst. Three weeks later RC sat 10.8 nT above its level before the storm, not below, and just outside the ordinary range of −12.6 to +10.2 nT, on the high side. So on RC the pass mark as we wrote it is missed, in the direction opposite to a lasting depression. We report it as it came out (our analysis).

What Dst can and can't show

It shows that the disturbance decayed, to within the few nanotesla by which its level wanders from week to week. It can't rule out a change in the core's field smaller than that, or one far from its observatories. Kyoto's values for 2023 are provisional, and from March 17, 2017, to June 6, 2018, its final values were computed from three observatories or fewer, San Juan's data being missing [13]. For the slow field we turn to a model of the core, which has the opposite limits.

The dipole, year by year



How much the axial dipole weakened in each calendar year, CHAOS-8.7

Our analysis of CHAOS-8.7, a model of the core's field fitted to satellite and observatory measurements (Kloss and colleagues, DTU Space, CC BY 4.0) [16], with IGRF-14's forecast [17]. The axial dipole, $|g_1^0|$, is the field's largest term, about 29,373 nT in March 2023.

The axial dipole's fall, with exact dates

FROM	TO	FALL, NT
March 23, 2021	March 23, 2022	8.8
March 23, 2022	March 23, 2023	10.9
March 23, 2023	March 23, 2024	12.3
March 23, 2024	March 23, 2025	11.7
March 23, 2025	March 23, 2026	12.9
January 1, 2018	January 1, 2019	6.5
January 1, 2022	January 1, 2023	10.3
January 1, 2023	January 1, 2024	12.3
January 1, 2024	January 1, 2025	11.7
January 1, 2025	January 1, 2026	12.7

Our analysis of CHAOS-8.7 [16]. IGRF-14 forecasts 12.6 nT a year for 2025–2030 [17].

OUR ANALYSIS

A speeding-up that ends at the storm, not one that begins there

In the two years before March 23, 2023, the axial dipole fell by 8.8 nT a year; in the two years after, by 12.0. That step, 2.2, is a larger speeding-up than any in 2001–2019, when the largest was 1.6, though around 2014–2015 the weakening slowed by about as much, 2.3. It is not the storm's: the same comparison is larger still for every quarter of 2022, and it peaks at mid-2022, at 3.0. Our rule, written beforehand, set the storm's date against all 97 quarter-years from 2001 to 2025, its own neighbours among them; 95% of those values lie between −2.9 and +2.2, and the storm's −2.2 is inside, at the 7th percentile, where the pass mark was the 2.5th. But neighbouring quarters share most of their four-year windows, so that comparison can't separate a date from the episode around it, and we don't lean on it [16].

What the model shows is a speeding-up that began in 2019–2020. The dipole fell 6.5 nT in 2018 and 12.3 nT in 2023. The speeding-up was steepest in mid-2022, nine months before the storm, and from mid-2023 the pace is level, at about 11.5 to 13.2 nT a year. That is the pace of 2000–2009, which averaged 12.1, and it is IGRF-14's forecast [17]. In the report's words the storm was "the acceleration event beginning" [3 00:04:19–00:04:21]; in the model, a speeding-up that began in 2019–2020 ended within months of it. The dipole's own pole moved 4.5 km a year before and after. Our check of S0 News's field note sees the same rise against the last 180 years.

A model of this kind is a smooth curve through years of measurements, with points half a year apart. It can't show a step on one day, and would spread one over months; it can show a change of pace that lasts a year or more, and its last year is the least certain. So Dst is the test for the day and the model the test for the years after. Neither can turn the field of currents in space into a change of the core [16].

5 · FLORIDA'S RED SKY

One photograph, and it looks south-west: the storm's aurora could stand only in the north

The note calls the Florida record "camera-only", grades it "Medium confidence" and keeps a "possible airglow/SAR-arc ambiguity" [1 §4]: airglow is the upper air's own faint light, there on any night, and a SAR arc is a stable red arc that a storm can raise on the equator's side of the aurora. That is fair to the record. Reading the gallery entry and the photograph themselves adds one thing the note doesn't draw out: which way the camera faced.

What the record is

Entry 194634 in Spaceweather.com's gallery, uploaded on March 26, 2023, by Bill Williams, from Chiefland Astro Village, Florida, at 29.4° N [9]. It is a long exposure through a fisheye lens, made to catch the winter Milky Way as it set, on the night of March 23–24; the entry gives 26 minutes [9]. The stamp on the photograph reads 00:12 to 00:34 Eastern time on March 24, which is 04:12–04:34 UT, and the stars in the frame don't fit it; by them and the tree line the exposure began before about 03:45 UT (our analysis). So, like the note, which says "no precise exposure time is inferred here" [1 §4], we infer no exact time; the directions below hold for any hour the stars allow. The stars don't say whether it fell in the storm's strongest three hours, at Kp 8o from 03 to 06 UT [14].

What its photographer wrote

That the glow was on the "western horizon", over the Suwannee River basin and the Gulf of Mexico, where the sky is normally very dark, and that it ran "from the northwest to the south". That the observers there first concluded it was most likely airglow, there being no rocket launch or wildfire, and took it for aurora the next day, on reading of the storm [9]. So the first to read the glow as airglow was the photographer. Spaceweather.com ran the picture on March 27 as red auroras over Florida, judging aurora most likely on such a night while granting that airglow would ordinarily explain such a picture [10 Mar. 27]; Newsweek and two other outlets retold it [11][26].

The photograph's own labels, and where each lay in the sky

LABEL	IN THE FRAME	HEIGHT	DIRECTION
"Ocala lights"	bottom left	the photographer's label f tree line; not a star	
"Gegenschein"	left, high	41–49°	122–134°
"Vela SNR"	bottom centre	12–14°	190–198°
"Sirius"	right of centre	21–29°	227–235°
"Rosette"	right	32–41°	249–257°, west
"Barnard's Loop"	right, half-way up	16–26°	253–259°, west
"Beehive"	top	66–75°	233–252°
"Red Aurora"	two arrows to the glow along the tree line and Orion		
"? Aurora"	one arrow to a faint patch left of centre, b		

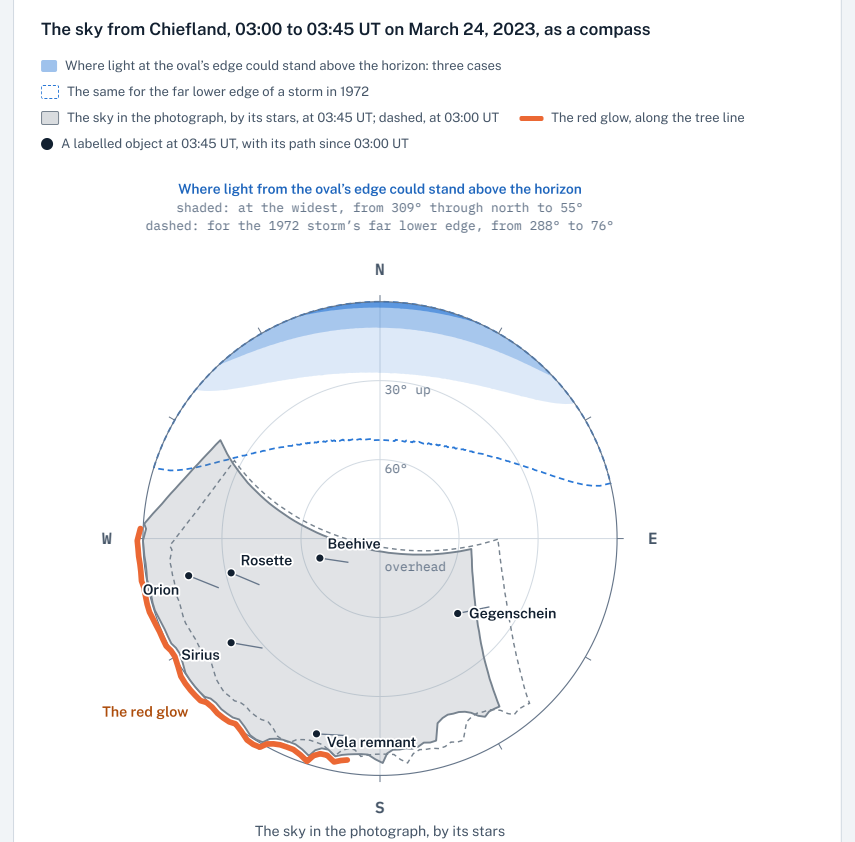
Our analysis: positions from 03:00 UT on March 24, 2023, to the latest start the stars and the tree line allow, about 03:45 UT, seen from Chiefland (29.41° N, 82.86° W) and computed from catalogue coordinates; earlier still, each stood higher and further from north. Directions are azimuths, clockwise from north; Ocala lies about 109° from Chiefland, outside the frame, whose tree line begins at about 139° to 146°. For Barnard's Loop we used Orion's Belt; for the Gegenschein, the point opposite the Sun. The labels are the photograph's [9], which we link and don't host. A tenth label, "Farmer's light", marks a lamp.

OUR ANALYSIS

The frame holds no northern sky

We solved the frame from 64 of its own stars, to about a pixel (section 10). Its tree line runs from the south-east, through the south, to the west, and its upper right corner reaches the west-north-west: azimuth 298° to 301° at the exposure's start, some 19° to 28° up, and about 304° by the end of a 26-minute exposure begun at 03:45 UT. The glow marked "Red Aurora" lies along the tree line between south-south-west and west; the patch marked "? Aurora", with its question mark, lies toward the south. The frame holds no northern sky: nothing in it lies north of about 305°.

Aurora is arranged around the magnetic pole, which from Chiefland lies almost due north. For a storm of this size the published edge of the overhead aurora is 56° of magnetic latitude on Love and colleagues' model, and 50.5° to 58.8° in satellite measurements of six storms of like strength, 144 to 175 nT [21 §3][21 Table 2]. Chiefland is at 38.4°. Light at such an edge could stand above Chiefland's horizon only in the northern part of the sky.



The sky from Chiefland, 03:00 to 03:45 UT on March 24, 2023, as a compass

Where light at the oval's edge could stand above the horizon: three cases
The same for the far lower edge of a storm in 1972
The sky in the photograph, by its stars, at 03:45 UT; dashed, at 03:00 UT
The red glow, along the tree line
A labelled object at 03:45 UT, with its path since 03:00 UT
Where light from the oval's edge could stand above the horizon
shaded: at the widest, from 309° through north to 55°
dashed: for the 1972 storm's far lower edge, from 288° to 76°
N
30° up
60°
E
S
W
Beehive
overhead
Rosette
Orion
Gegenschein
Sirius
The red glow
Vela remnant
The sky in the photograph, by its stars

Our analysis; our own diagram, not a copy of the photograph [9]. North is at the top and east at the right, as on a map; the outer circle is the horizon and the centre is overhead. The blue wedges are, from palest to darkest: an edge at 50.5° with red light up to 950 km high; the same edge at 400 km; and the model's edge, 56°, at 400 km [21][22 Abstract]. The dashed blue outline is an edge at 40.9°, at 400 km [21 Table 2]. The grey area is the sky the photograph holds, solved from 64 of its stars; earlier in the night it lay further from north, as the dashed grey outline shows.

Where light from the oval's edge could stand, seen from Chiefland

THE OVAL'S EDGE	HEIGHT OF THE LIGHT	HIGHEST, DUE NORTH	ABOVE THE HORIZON BETWEEN	5° UP OR MORE BETWEEN
56°, the model's [21 §3]	400 km	2.3°	340° and 24°	nowhere
56°	500 km	4.8°	332° and 32°	nowhere
50.5°, the lowest of the six satellite edges [21 Table 2]	400 km	9.9°	318° and 47°	329° and 35°
50.5°	500 km	13.5°	315° and 50°	322° and 42°
50.5°	950 km, a generous top [22 Abstract]	27.0°	309° and 55°	312° and 52°
40.9°, that table's lowest for a storm under 200 nT [21 Table 2]	400 km	52.5°	288° and 76°	288° and 76°

Our analysis, with magnetic latitude taken from the dipole's axis in CHAOS-8.7 [16] and no refraction. Directions are clockwise from north, so "340° and 24°" is a span of 44° centred on north. At the directions of Vela, Sirius and Orion, no line of sight from Chiefland reaches a magnetic latitude above Chiefland's own red light 5° up there would have to come from 38.4° or lower. The last row is a far lower edge in the same table, for the storm of November 1, 1972, which at 190 nT was a little stronger than this one; we offer it only to show, to see whether the finding rests on the choice of edge. Even with it, no light stands above the horizon at Orion, Sirius or Vela; it would reach only the frame's upper right corner, which the stars put at azimuth 298° to about 304°.

OUR ANALYSIS

Possible in the north; not in this photograph

Faint aurora low in the north was physically possible from Chiefland that night. With the oval's edge at 50.5°, the lowest of the six satellite figures, and red light 400 to 500 km up, it could have stood 10° to 14° above the northern horizon; with the model's edge, 2° to 5°, or under a line of trees; with an edge as low as the 1972 storm's, more than half-way up the northern sky. Observers further north saw it that way: the three of the gallery's six lowest other entries that give a direction all give north (the table below) [18], and Spaceweather.com's page of March 26 puts the red on the northern horizon in New Mexico [10 Mar. 26]. A red arc of the kind recorded that night from Oklahoma would also have stood in Chiefland's north: at 44° to 46° of magnetic latitude and 400 km up, from about azimuth 300° through north to 65°, at most 21° to 29° high. This photograph doesn't look there. The glow it shows, low in the south-west and west, lies where light from the oval as published could not stand above the horizon at any height, from 400 up to 950 km, and whichever edge in the table above is chosen.

What it is that horizon we can't say. Airglow was the photographer's first reading [9], and Spaceweather.com's entry grants that it would ordinarily explain such a picture [10 Mar. 27]. A frame of the northern sky from the same site and hour would settle whether aurora reached Florida's sky; so would a spectrum of the glow, or a second record. We found none.

Our review of 50 News of November 1, 2026, read Spaceweather.com's item and not the gallery entry, took the glow to be in the north, and rated the record Unconfirmed; that page is corrected.

The gallery's lowest other entries for the same night

Scroll sideways to see the whole table →

PLACE	LATITUDE	MAGNETIC LATITUDE (OURS)	WHAT THE ENTRY DESCRIBES	DIRECTION GIVEN
Hope, New Mexico	32.8° N	40.3°	A colourless brightening to the eye, with pillars that shifted now and then; a 30-second exposure	none given
Southern Oklahoma	about 34° N	about 42°	A red arc high in the sky in long exposures, then pillars seen by eye	the northern horizon
Prescott, Arizona	34.5° N	41.3°	Aurora seen from home, a 30-second exposure; also reported near Phoenix	none given
Boone, North Carolina	36.2° N	45.2°	Dim reds and purples that the eye could still pick out, 03–04 UT	none given
Keeler, California	36.5° N	42.5°	A faint glow by eye; a one-minute exposure, much brightened, showed red	to the north
Beatty, Nevada	36.9° N	43.1°	Hard to see by eye; colour in a 10-second exposure	facing north

Paraphrased from six entries in Spaceweather.com's gallery, each dated to the night of March 23–24, 2023, by its photographer [18]; latitudes are ours where the entry gives none, and magnetic latitudes are by the same dipole axis that puts Chiefland at 38.4°, as the nearest; Hope is 2° away [18]. Scientific American, on March 30, 2023, put the display's southern reach at Phoenix, Arizona, and Asheville, North Carolina, and wrote of viewers in the south looking north [23].

6 · THE SCINTILLATION PAPER

Radio signals flickered from Peru to Texas that night; the note reports the paper fairly

The note's last source is a 2025 paper in *Space Weather* by Gomez Socola and colleagues [12]. The note uses only its abstract, and says so [1 §5]. So did we at first; we have since read the whole paper, from a copy the site's owner downloaded.

What the paper reports

On the night of March 23–24, 2023, three monitors recorded scintillation, a rapid flickering of the L-band radio signals that satellite navigation uses: at Jicamarca in Peru, on the magnetic equator; in Costa Rica; and at the University of Texas at Dallas, at about 42° of magnetic dip latitude, where intense scintillation is rare [12 Abstract]. In Costa Rica it was extremely intense for about ten hours from about 01:30 UT; in Texas it began between 03:30 and 04:30 UT, was strongest near 05:00 UT and ended by 07:30 UT, mostly on signals passing south of the site [12 §3.3][12 §4]. Maps of how fast the ionosphere's electron content changes show a narrow channel of irregularities that rose from low latitudes from about 01:00 UT and reached the southern United States, at 40° of dip latitude, between 03:30 and 04:30 UT: near 80° W at 03:30 UT, then drifting west [12 §3.4]. The authors tie the scintillation to depleted patches of the ionosphere that form near the equator, and note that such depletions reach middle latitudes in the dense ionosphere on either side of the equator much stronger than on the nights before and after, with enhancements as far as the southern United States [12 §3.2][12 §3.5].

OUR ANALYSIS

What it does and doesn't add

The note's account matches the paper point for point: the three sites, the rarity at middle latitudes, the depleted patches and the maps. It adds, correctly, that these are "radio/ionospheric observations, not optical verification of the Florida glow" [1 §5]. The paper is evidence that the storm disturbed the ionosphere over the Americas, which nobody disputes. It says nothing of Earth's own field. Nor does it say anything of light: it uses radio signals and maps of electron content only, reports no optical observation and never mentions airglow [12 §2].

7 · "NO NEW CLAIMS"

Careful in its distinctions; its one leap is to set a storm beside itself

The note says of itself that it offers "published findings and interpretations for scientists to ponder, with no new claims, measurements, statistics, or mechanism determination" [1 Appendix]. Most of that holds.

Where the note is careful

It keeps a severe storm apart from a large flare, G4 from G5, Dst from SYM-H, a geographic from magnetic latitude, and a photograph from a sighting by eye [1 §5]. It says that "A single exposure does not by itself provide evidence of naked-eye visibility or a spectroscopically identified emission" [1 §4]. It flags a conflict in the gallery entry's dates, since it read only the abstract of its last source, and says twice that it adds no claim. Every quotation we could check is exact.

OUR ANALYSIS

Where its framing leans

Its third section is headed "Simonenko: the strongest magnetic anomaly in six years, on the Florida aurora night", and says the anomaly and "the first Florida aurora of Solar Cycle 25 fall on one night" [1 §3]. But the anomaly is the storm (section 3), and a glow photographed during a storm would be the storm's effect: they can't fall on one night as two things. The note does call the anomaly a "disturbance" and says the paper cites NOAA's notice, so a careful reader can tell; it never says outright that the two are one. The note's closing asks readers not to turn "coincidence into a new causal claim" [1 §5]; there is no coincidence to turn. The same sentence states as fact that an aurora the note's own grades Medium and camera-only reached Florida [1 §4]. And the note adopts "magnetic anomaly", in its opening, its heading and its summary, without saying what the paper means by it or what the paper argues.

8 · WHAT THE REPORT SAID

The report turns a storm ranking into "a major acceleration event in the ongoing magnetic pole shift"

S0's special report of November 11, 2026, brings in the storm as a point on its chart of Florida auroras, then as the day the pole shift sped up [3 00:03:30–00:04:21]. We worked from the transcript; we didn't see the video's graphics.

The report's words, the note's words and the sources

Scroll sideways to see the whole table →

THE REPORT	THE NOTE	THE SOURCES
"But then again, those weren't coinciding with the most extreme magnetic anomaly that we've seen." [3 00:03:42–00:03:46]	"what Simonenko ranks as the strongest magnetic anomaly in six years" [1 §3]; and the storm is "modest beside March 1989" [1 §3]	Six years, not all we've seen [7 Abstract]. The anomaly is the storm; its storms of the six years before it were a lower, reached −176 nT in August 2018 and the March 1989 storm went to −589 nT in 1989 [13]
"It was that March 2023 super aurora that started it all." [3 00:03:46–00:03:52]	"camera-only", "Medium confidence", "possible airglow/SAR-arc ambiguity" [1 §4]	One long exposure of the south-west sky; no second record found (section 5) [9]
"that was the day that Russian scientist Sergey Seenko logged a titanic magnetic anomaly, a major acceleration event in the ongoing magnetic pole shift. And what I mean by that is that is the acceleration event beginning." [3 00:04:07–00:04:21]	Simonenko "ranks" the disturbance, "citing NOAA's G3 notice" [1 §3]; the note makes no "mechanism determination" [1 Opening]	The papers take the event from NOAA and measure nothing [7 p. 61][8 §3.1]. The 2024 paper's possible reversal begins in 2007; nothing in either begins in 2023. NOAA's G3, a K-index of 7, was on G4, on a scale of five [5][15]

Times are positions in the video, from the automatic transcript, which writes "Seenko" for Simonenko [3].

OUR ANALYSIS

The last row is the one we rate, with the first. It is a misreading of a real source. Simonenko's papers call a NOAA storm notice a "magnetic anomaly", rank it over six years, and offer it as support for a theory of the gravity of the planets and the Sun; the 2024 paper's talk of a reversal is dated to 2007 and mostly hedged as "possible" [7 Abstract]. The note relays the ranking and says it determines no mechanism [1 Opening]. Neither says "titanic", and neither says anything accelerated. The measurements say the disturbance was gone in five days and that the dipole's pace had been level since mid-2023 (section 4).

This is the third time we have met this reading of this paper. Our video check rated "A 'major magnetic anomaly' in 2023" Misread, and our review of 50 News of November 1, 2026, gave the same verdict under the label used here. The evidence hasn't changed; the recovery and dipole tests are new and point the same way.

Two numbers from our other pages on this report bear on its first row. Our review of the report counts 118 storms since 1957 that reached −163 nT or lower in Dst before March 2023, and 185 since 1932 that reached Kp 8o or more. And our check of the paper behind the report's first link finds that, set against the solar-wind input, Earth's geomagnetic response in 2023–2025 sat inside the range of earlier years, a little below the earlier relation month by month and a little above it hour by hour: no sign of an Earth that answers the Sun more strongly.

9 · LIMITS

What this check can and can't say

Our tests ran under rules fixed before the data were read, with one exception, which we name (our analysis).

The photograph's direction was not planned

The compass test arose from reading the gallery entry, so its rules were written after we had seen the photograph, though before any position was computed; they lay as: Two parts were added after its first results: the red glow's own direction, because of the note; the reverse question, of how near red light would have to be to stand 5° up in each direction; and the 1972 storm's edge, added while this page was being written. After a fresh reviewer we solved the frame from its stars, by ordinary methods, and the three directions were compared. The storm's edge, and the reverse question gallery's copy is 730 pixels wide, and the tree-line check can have began [9].

What direction can't tell

The direction rules out light from the oval, or from a red arc north of Florida. It can't tell airglow from red emission at Florida's own magnetic latitude, which no published edge for a storm of this size reaches [21 Table 2].

Magnetic latitude, simply taken

We place the oval by the dipole's axis alone, a first approximation to the coordinates that arrange aurora. Love and colleagues' model describes the lowest overhead aurora, not any glow, and was set on storms deeper than −300 nT [21 §2][21 §4]; their table of satellite edges holds one for a storm of 190 nT, 40.9°, almost ten degrees below any other it gives for a storm under 200 nT [21 Table 2]; the 950 km top in the upper figure one study gives for red aurora in another storm [22 Abstract].

Provisional values

Kyoto's Dst from January 2021 is provisional, and no final value for the storm exists yet [13]. We read no real-time value, and none is published here. GFZ's Kp is definitive to October 31, 2026 [14].

Indices are not the field

Kp is capped at 9 and Dst measures the ring current. None of the storm measures here measures the field Earth makes in its core; the model that does can't see a single day [16].

Sources read in part, or not at all

The note's source pack and internal inventory, not at all [2]. The web article behind Simonenko's January 2020 "anomaly" is gone from its address [7 p. 61]. Love and colleagues' and Vichare and colleagues' papers we read for our review of November 1 [21][22].

The report's graphics

We worked from the transcript; what the report showed on screen, and its "that one up there", can't be checked [3].

What would change these verdicts

01

A second record of aurora from Florida on the night of March 23–24, 2023, a frame of the northern sky that night, or a spectrum of the glow. Any of them could move the third verdict either way [9].

02

Kyoto's final Dst for 2023. It could settle the ring-current row of the ranking; it would not change the Kp rows [13].

03

The note's source pack made public, so that its inventory and its Dst comparison could be read [2].

10 · REPEAT OUR NUMBERS

The rules, the scripts and the derived numbers; the note and the photograph stay with their owners

Every number of ours on this page comes from these files. The first script fetches the public inputs by URL under a plain-client name and checks each against the copy we used [13][14] [15][16]. We host only numbers we derived: none of the note's text or figure, nothing of the photograph, and no file of raw index values.

- PY **march_2023_storm.py** — Standard library only. Fetches the 197 input files listed in inputs.txt, checks each against the SHA-256 of our copy, runs the seven analyses and says whether each output equals ours. It never asks Kyoto for a real-time page · 9 KB
- PY **storm_rank.py · dst_recovery.py · rc_check.py · dipole_pace.py · photo_geometry.py** — The first five analyses: the storm's rank, the recovery of Dst, the same on DTU's RC index, the dipole's pace in CHAOS-8.7, and where the photograph's labelled objects lay and where auroral light could stand · 25 KB, 11 KB, 5 KB, 15 KB, 16 KB and 12 KB
- PY **photo_stars.py · photo_gallery_others.py** — Added after the page's first version. The Chiefland frame solved from its stars; the other records' magnetic latitudes and a red arc; and the same sort of direction put to the photograph of April 2023 that our review of November 1 used, and to the 1972 storm's edge · 20 KB and 27 KB
- TXT **chiefland-star-points.txt · chiefland-tree-line.txt · star_points.py · tree_line.py** — Our measurements of the Chiefland photograph, which we link and don't host: the 268 brightest points in it and the tree line, column by column; and the two short scripts that made them from the gallery's image, they need Pillow · 11 KB, 1 KB, 2 KB and 2 KB
- TXT **RULES_rank.txt · RULES_recovery.txt · RULES_dipole.txt · RULES_photo_geometry.txt · RULES_florida_search.txt** — The rules of each test and of the search, with their stated amendments. The first three and the search were hashed at 16:07 UTC on November 11, 2026, before the indices were fetched; the photograph's rules at 16:39 UTC, after we had seen it, as the stars and the tree line show; with additions at 16:40, 17:39, 18:19 and 19:02 UTC. The last two after the page's first version and its first review · 7 KB, 6 KB, 5 KB, 14 KB and 2 KB
- JSON **storm_rank.json · dst_recovery.json · rc_check.json · dipole_pace.json · photo_geometry.json · photo_stars.json · photo_gallery_others.json** — Every number of the runs that made this page. Those from Dst carry Kyoto's conditions: scientific and provisional values, scientific and non-commercial use, with acknowledgement of the World Data Center for Geomagnetism, Kyoto, and of the observatories · 58 KB, 14 KB, 1 KB, 12 KB, 9 KB, 33 KB and 23 KB
- CSV **storms-2017-2026.csv · dipole-yearly-pace.csv** — The 37 and 31 storms of the first chart, with each one's peak or lowest value; the axial dipole's fall in each calendar year, 1998–2026, the last a part year that the chart leaves out · 5 KB and 1 KB
- PY **chaos_reader.py · charts.py** — The readers for the CHAOS and IGRF files, copied unchanged from our check of the field-loss figures; and the script that draws this page's four charts from the outputs and from Kyoto's pages · 6 KB and 24 KB
- TXT **inputs.txt · HASHES.txt** — Each input's address, size and SHA-256 as we fetched it on November 11, 2026; and our log, with the time and SHA-256 of every rules file as first written and as amended, and the checksums of every file here · 24 KB and 10 KB

Run it

With the files in one folder, `python3 march_2023_storm.py <folder>` fetches the inputs into `<folder>/out`, about 23 MB, with a pause between requests, and writes the outputs into `<folder>/out`; the analyses themselves take under a minute. GFZ's file grows daily, so its checksum will differ from ours; `--until 2026-11-10`, the default, ignores later days. A provisional Kyoto month may since have been revised or made final, and the script says which. `python3 charts.py <folder>/out <folder>/kyoto_dst` redraws the charts. Standard library only, Python 3.8 or later.

Related checks

MISREAD A "major magnetic anomaly" in 2023 The Disaster Cycle, Fact-Checked

FALSE More auroras from less solar input? The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For S0 News's research note [1], § is one of its five numbered sections; Opening is its first paragraph, Figure 1 its chart and Appendix its closing part, "Methods / source pack". For S0's special report [3], locators are times in the video, from the first to the last second of the automatic transcript that holds the words quoted. For papers, § is a section and p. a page, numbered as in the version the entry names, and Abstract and Table are the parts read. For Spaceweather.com's archive [10] a date names the daily page. Where only an abstract was read, the entry says so. Times of NOAA's products are UTC; t7 is the seventh interval. Kp, ap and Ap are indices of geomagnetic storms; K is NOAA's own running estimate of Kp, and G1 to G5 its storm scale. Links checked November 11, 2026.

1. S0 News (Space Weather News) (undated). MARCH 2023: A MISSED CME, A SEVERE STORM, AND FLORIDA'S RED SKY. "Space Weather News Research Note from internal GrokBot Team 006", headed "SPACE WEATHER NEWS & RESEARCH PUBLICATIONS 2026". A public Google Doc, undated; retrieved November 11, 2026, at 15:56 UTC, when our text export had the SHA-256 e3d9bee... No licence is stated, so it is linked, not hosted, and its figure is not reproduced. Not peer reviewed.
2. S0 News (Space Weather News) (undated). The note's "source pack". A Google Drive folder which, the note says, holds its list of sources, a comparison of Dst values, snapshots of its sources and the internal inventory it cites as reference [8]. When checked at 15:41 UTC on November 11, 2026, Google asked for a sign-in. We don't sign in, so we haven't read it.
3. SpaceWeatherNews (S0) (November 11, 2026). SPECIAL REPORT: Pole Shift -Part 2. YouTube video, https://www.youtube.com/watch?v=CwcmU6oc38A. Quoted from techkyla's automatic transcript, supplied by the site's owner; times are positions in the video. We didn't see the video's graphics. Reviewed on our page for the report.
4. Teng, W., Su, Y., Ji, H., and Zhang, Q. (2024). Unexpected major geomagnetic storm caused by faint eruption of a solar trans-equatorial flux rope. *Nature Communications* 15, 9198. Peer reviewed; open access, CC BY-NC-ND 4.0, so it is quoted briefly and none of its figures is reproduced. Read in full, in the publisher's PDF and in the PubMed Central copy the note cites; page numbers are of the PDF.
5. NOAA Space Weather Prediction Center (March 23, 2023, 16:59 UTC). G3 (Strong) Geomagnetic Storming Observed 23 March 2023. The note's reference [2], and the reference both of Simonenko's papers give for the event. Read in full.
6. NOAA Space Weather Prediction Center (March 24, 2023, 04:41 UTC). G4 (Severe) Geomagnetic Storm Alert on 24 March UTC-Day. The note's reference [3]. Read in full.
7. Simonenko, S. V. (2024). The Combining Cosmic Energy Gravitational Genesis of the Strongest Geomagnetic Anomalies of the Magnetic Field of the Earth. *Prevention and Treatment of Natural Disasters* 3(1), 51–62. CC BY 4.0. The note's reference [4]. Read in full; the word searches are ours. p. gives its page; its list of references is on p. 61, and the fifth is NOAA's notice [5]. Crossref's record misspells the note's title [20].
8. Simonenko, S. V. (2023). The Validity of the Thermohydrogravidynamic Theory Concerning the Predicted Dates of the Maximal Temporal Intensifications of the Global Seismotectonic Processes of the Earth during the Range 2020–2023 AD. *Journal of Geoscience and Environment Protection* 11(7), 242–255. CC BY 4.0. The note's reference [5]. Read in full; § gives its section and p. its page.
9. Williams, B. (uploaded March 26, 2023). Fiery Midnight Florida Aurora! Spaceweather.com's photo gallery, entry 194634, from Chiefland Astro Village, Florida. The note's reference [6]. All rights reserved; paraphrased here, with two short phrases and the photograph's labels quoted. The photograph is linked, not reproduced; its labels and stars it is through the entry and not hosted. Read November 11, 2026.
10. Spaceweather.com. Daily archive pages of March 24, March 26, March 27 and March 30, 2023. All rights reserved; paraphrased here. A date names the page. The March 27 page is the note's reference [10]; it was read again on November 11, 2026, and was the same file as on November 1, when the others were read for our review of that day's episode.
11. Thomson, J. (March 29, 2023). Red Auroras Seen as Far South as Florida in Rare Light Show. Newsweek. The note's reference [11]. Paraphrased here.
12. Gomez Socola, J., Rodrigues, F. S., Sousasantos, J., Quesada, M. R., Hinks, E., Otsuka, Y., Shinbori, A., Nishioka, M., and Perwitasari, S. (2025). On the Extraordinary L-Band Scintillation Event Observed in the American Sector During the 23–24 March 2023 Geomagnetic Storm. *Space Weather* 23(8), e2024SW004213. Peer reviewed; open access, CC BY-NC 4.0. The note's reference [12]. Read in full, from the copy the site's owner downloaded on November 11, 2026; paraphrased here, and none of its figures is reproduced. § gives its section.
13. Nose, M., Iyemori, T., Sugiura, M., and Kamei, T. World Data Center for Geomagnetism, Kyoto (2015). Geomagnetic Dst index: hourly values from the WDC's monthly pages for March 1989 and for March 2017 to September 2026, final to December 2020 and provisional after; they include the two tables the note cites as references [7] and [9]. Read November 11, 2026, with the WDC's usage rules: scientific use, no commercial use, with acknowledgement of the WDC and of the observatories that supply the data. The rules ask that the WDC be contacted before its real-time values are published; we read none, and none is published here. The WDC's caution of July 24, 2024, lists San Juan's data as missing from March 17, 2017, to June 6, 2018, and says the final index used three stations or fewer in such periods.
14. Matzka, J., Stolle, C., Yamazaki, Y., Bronkalla, O., and Morschhauser, A. (2021). The geomagnetic Kp index and derived indices of geomagnetic activity. *Space Weather* 19(5), e2020SW002641. Data: Matzka, J., Bronkalla, O., Tornow, K., Elger, K., and Stolle, C. (2021). Geomagnetic Kp index, V. 1.0, GFZ Data Services, as of November 11, 2026: definitive to October 31, 2026, preliminary after that. Kp, ap and Ap from Geomagnetic Observatory Niemegk, GFZ Helmholtz Centre for Geosciences. CC BY 4.0; counted by us.
15. NOAA Space Weather Prediction Center. Alerts, watches and warnings: the Center's monthly archive of the messages it issued (ftp.swpc.noaa.gov, pub/alerts/), March 2017 to March 2023. 73 files. Read November 11, 2026; counted by us.
16. Kloss, C., Finlay, C. C., Olsen, N., Tøffner-Clausen, L., Gillet, N., and Grayver, A. (2026). CHAOS-8.7, released September 30, 2026, with satellite data to August 31, 2026 (doi:10.5281/zenodo.22559079). CC BY 4.0, from DTU Space's CHAOS-8 website; the core field's spline coefficients, the same file's Dst-like RC index and the RC index released with it, an hourly index of the ring current from 14 observatories. Retrieved November 11, 2026, when 8.7 was still the newest release. The numbers from them are ours.
17. IAGA Working Group V-MOD (2024). International Geomagnetic Reference Field, 14th generation (IGRF-14): Gauss coefficients 1900–2025 and secular variation 2025–2030. Data file, NOAA National Centers for Environmental Information; retrieved November 11, 2026, the same file, by its SHA-256, as on November 1. The numbers from it are ours.
18. Spaceweather.com. Realtime Image Gallery: its aurora index and its whole index for uploads of March 23 to April 16, 2023 (39 index pages), and six entries dated by their photographers to the night of March 23–24, 2023, numbers 194763 (Hope, New Mexico), 194739 (southern Oklahoma), 194688 (Prescott, Arizona), 194363 (Boone, North Carolina), 194895 (Keeler, California) and 194906 (Beatty, Nevada). All rights reserved; searched by us for Florida, and paraphrased here. Read November 11, 2026.
19. Parshall, A. (March 30, 2023). Northern Lights Dance across U.S. because of "Stealthy" Sun Eruptions. *Scientific American*. Paraphrased here.
20. Osborne, H. (March 24, 2023). Most powerful solar storm in 6 years caused auroras all over the US. And nobody saw it coming. Live Science. Paraphrased here.
21. Love, J. J., Mann, I. R., Quick, T., and Mursula, K. (2025). What Is the Lowest Latitude of Discrete Auroras During Superstorms? *Space Weather* 23(4), e2024SW004286. CC BY 4.0. Full text as read in the University of Oulu's repository for our review of November 1, and checked again in our saved copy; § gives a section and Table a table.
22. Vichare, G., Bhaskar, A., Rawat, R., Yadav, V., Mishra, W., Angchuk, D., and Singh, A. K. (2024). Low-latitude Auroras: Insights from 2023 April 23 Solar Storm. *The Astrophysical Journal* 977(2), 171. CC BY 4.0. As read for our review of November 1, in the preprint, arXiv:2405.08821v1; cited here only for the heights its abstract gives for red aurora.
23. NASA. Astronomy Picture of the Day, the 18 daily pages from March 24 to April 10, 2023; the one aurora picture among them is March 27's, from Iceland. Read November 11, 2026.
24. UK Scientific Publishing Limited. Prevention and Treatment of Natural Disasters: About the Journal. With OpenAlex's record of the journal and a search of the Directory of Open Access Journals for its ISSN, 2737-7544. Read November 11, 2026.
25. Scientific Research Publishing. Journal of Geoscience and Environment Protection: Aims & Scope, and its indexing page. With OpenAlex's record of the journal and a search of the Directory of Open Access Journals for its ISSN, 2327-4336. Read November 11, 2026.
26. The Watchers (March 28, 2023). Red auroras descend to Florida, marking first sighting since 2003 and 1989, as read for our review of November 1; and Jordan, R. (March 30, 2023). Red Auroras Seen All the Way to Florida. Nature World News. Both retell the gallery entry [9]. Paraphrased here.

METHOD

How this was checked

On November 11, 2026, we checked S0 News's research note 006: its five sections, its figure's two values and the statements in its appendix. We checked each quotation and number against the reference the note cites for it; eleven of its twelve, and found every one exact. We then ran tests of our own on public data: the storm's rank among the storms of the six years before it and proper the storm's rank on GFZ's Kp, ap and Ap, Kyoto's Dst, DTU's RC index and NOAA's own alerts; the recovery of Dst and RC after the storm; the dipole's yearly pace in CHAOS-8.7; and, from the Chiefland photograph, first by its labels and then by its stars, the directions of its objects and the sky it holds. We searched 740 gallery entries, 18 days of NASA's picture of the day and the press for a second Florida record. We checked the report's sentences about the note against its transcript. Every statement on this page was checked against its source, 26 sources in all.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources. The rules of the rank, recovery and dipole tests and of the search were fixed and hashed before their data were fetched for this page; each amendment is dated in the rules files. We already knew the storm's own values and which two storms to set it against, from our review of November 9; the rules were written after we had seen the photograph, though before any position was computed; and the two we had looked at in it, the storm's own values were written, and the storm, the compass test of the photograph was not planned: its rules were written after we had read the gallery entry and seen the photograph, before any position was computed, and they say so. The second and fifth cases were added to it after its first results; the second while this page was being written, and the rules date each. The check on the RC index was registered before its file was fetched, and we report it as it came out, including where it misses the pass mark we had set.

We recomputed every number of ours with scripts in Python's standard library that any reader can run (section 10), and ran them twice with the same results. We couldn't read the note's source pack or the internal inventory it cites: Google asked for a sign-in, and we don't sign in. The scintillation paper, read at first in abstract only, was read in full later the same day, from a copy the site's owner downloaded; two forecast records the paper cites for the second ejection sit on a NASA server that didn't answer; and the web article behind one of Simonenko's three "anomalies" is gone from its address. Kyoto's Dst for 2023 is provisional, and we read no real-time value. We didn't see the report's graphics.

After the page was built, a fresh reviewer who hadn't seen the drafting re-ran the hosted scripts, which reproduced every number, repeated the five analyses with code of their own, solved the Florida photograph's frame from 64 of its stars, and checked every quotation, locator and source. No verdict changed. The changes that followed: the photograph's stars don't fit the times on its stamp, so we reported the time as its photographer's, by rules written when we had read the review, and now take the night from the entry and the direction from the stars, with positions as ranges and no exact time; the dipole test's run and the storm's date against its own neighbouring quarters, so its percentile no longer counts as a pass; one claim, which now says what the model shows, a speeding-up that began in 2019–2020 and levelled off within months of the storm; the second and fifth verdicts now rest on the fifth sentence; the report's words are quoted in fuller context; the night's other sightings carry their magnetic latitudes, and a red arc is addressed, and what the search could not reach is listed. Some two dozen smaller points were applied as well. We also put the same test of direction to the photograph of April 2023 that our review of November 1 uses, and the 1972 storm's edge. Two claims on other pages are corrected: our review of November 1 uses, and its links of January 2026, by rules fixed before either was opened; that review carries the result.

This page was researched and written with Claude, an AI assistant made by Anthropic, and then re-checked against its sources in a separate verification pass.

The verdicts on this page

MISREAD	Cites a real source but gets wrong what it says.
UNSUPPORTED	No evidence we could find backs it up, though it hasn't been strictly disproven.
PARTLY TRUE	Part of the claim holds up and part doesn't.
TRUE	The evidence supports the claim.

All ten verdicts and how we check

CORRECTIONS

Corrections and changes

If we get something wrong, we fix it and record the change below with the date. If a correction changes a verdict, the log says what the old verdict was.

Change log

Nov 11, 2026 — Updated November 11, 2026: we read Gomez Socola and colleagues' paper on the night's radio scintillation in full, from a copy the site's owner downloaded; we had read only its abstract. The full text bears out the note's account and ours, and adds times and places: in Texas the scintillation began between 03:30 and 04:30 UT, and the paper maps how the irregularities reached the southern United States near 80° W at 03:30 UT. The paper reports no optical observation and doesn't mention airglow. Section 6, the fourth verdict's text, the sources and the method are updated to match.

Nov 11, 2026 — Published on factchecked.science after a full check against the sources: S0 News's research note 006, whose quotations and numbers we found exact; the papers, notices, tables and gallery entry it cites; and our own tests of the storm's rank, the field's recovery, the dipole's pace and the Florida photograph's direction, with their rules, scripts and derived numbers posted. None of the note's text or figure and nothing of the photograph is hosted. A fresh review the same day changed no verdict; it led us to take no exact time for the photograph, whose stars don't fit its stamp; to solve its frame from its stars; to describe the dipole's speeding-up as one that began in 2019–2020 and levelled off within months of the storm, where we had said its pace did not change at the storm; to rest the second and fifth verdicts on the report's full words and sentence; and to add the night's other sightings. Our review of November 1, 2026, which had taken the photograph's glow to be in the northern sky and rated the record Unconfirmed; that page is corrected.