Fact-Checked Science

PAPER CHECK · GEOMAGNETISM

The core field accelerates most near the equator, in patterns that persist, not collapse

Three geophysicists in Madrid mapped the secular acceleration of Earth's magnetic field at the top of the core over 125 years, and a podcast read the maps as a "full equatorial collapse" of the field related to geomagnetic jerks. We read the paper's bibliographic record and an index copy of its abstract, and we re-ran the public field models it uses.

The acceleration gathers near the equator in lasting patterns, and nothing there is collapsing

OUR ANALYSIS

54%

of the acceleration's power at the top of the core lies within 20° of the equator, a band covering 34% of the surface, in the model the paper uses for 2000–2025

0.8–1.1×

the global level: the acceleration beneath the South Atlantic Anomaly

−0.99%

the change in the surface field's strength along the equator from 2000 to 2025, the same as worldwide

The claims

MISREAD

A new data point on a worsening pole shift

The paper studies where and how the core field's acceleration is organised; by its record and abstract it does not mention a pole shift, a reversal or an excursion.

MISLEADING

From sparse events to growing power and coverage

The recent maps are darker, but the rise sits at fine scales the early data cannot resolve; the large scales stay flat.

MISLEADING

The concentration points are the South Atlantic Anomaly, the Bermuda Triangle, a West Pacific anomaly and the Dragon's Triangle

The acceleration beneath the South Atlantic Anomaly is about average or weaker; the strongest patch lay inside the Bermuda Triangle only in 1950–1975.

TRUE

Secular acceleration gathers in a few latitude regions

The paper's abstract puts the concentration at low latitudes; by our re-run, 54% of the power lies within 20° of the equator.

FALSE

Earth has lost the plot, in a full equatorial collapse

Along the equator the field weakened 0.99% in 25 years, as much as everywhere else.

1 · A PAPER WE COULD NOT READ

Open access, but behind a CAPTCHA, and we found no other copy; we read its record and an index copy of its abstract

The paper is a peer-reviewed article in *Physics of the Earth and Planetary Interiors*, online October 5, 2026, in the volume dated December 2026, under CC BY 4.0 licence [1][3]. Its three authors work at the Complutense University of Madrid, two of them with the Spanish National Research Council [4]. Its text was out of our reach [1].

OUR ANALYSIS

What that means for this check

We rated what the paper's record, its abstract and its public models support, and the episode's statements against them. The paper's figures, epochs, regions, numbers and caveats are unverified.

The abstract, in brief

The authors study the secular acceleration of Earth's field, the second time derivative of the core field, over the past 125 years for 2000–2025, and in three models. A regional analysis finds dominant patterns that persist over decades, with centres at low latitudes and in a few sectors, the Atlantic, Pacific and Indian among them, and relates their strength changes to geomagnetic jerks [4]. No abstract text is quoted on this page.

2 · JERKS AND THE MODELS

Jerks have broken the field's slow change at least a century, and the three models the paper uses them with very different sharpness

Earth's internally generated field changes slowly; the secular variation, its rate of change, and the secular acceleration, the change in that rate. Mapped down to the top of the core, about 2,900 km below the surface, they show the field's rate of change at its source.

Why jerks matter to field models

A field model forecasts a few years of secular variation from the trend it last saw; a jerk breaks the trend, and the forecast fails.

The three models the paper uses, as their makers describe them

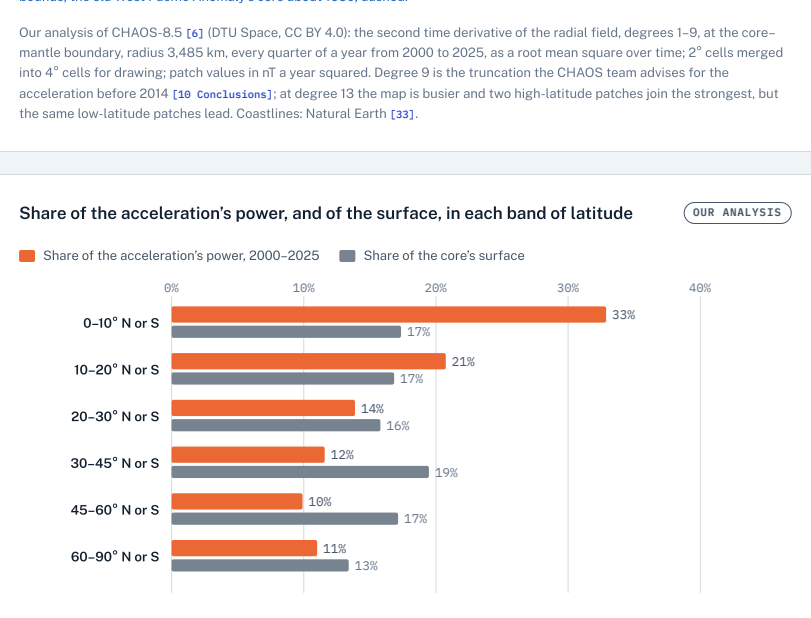
MODEL	USED IN THE PAPER FOR	BUILT FROM
CHAOS-8.5	2000–2025 [4]	Satellite and observatory data; "valid from 1999 to 2025" [5 Abstract]
Kalmag	The 20th century [4]	Satellite and observatory data, ...
COV-OBS.x2	The 20th century [4]	Observatories, surveys, satellites; 1840–2020 [7 Abstract]

3 · WHERE IT GATHERS

In the model the paper uses for 2000–2025, the acceleration gathers within a few degrees of the equator

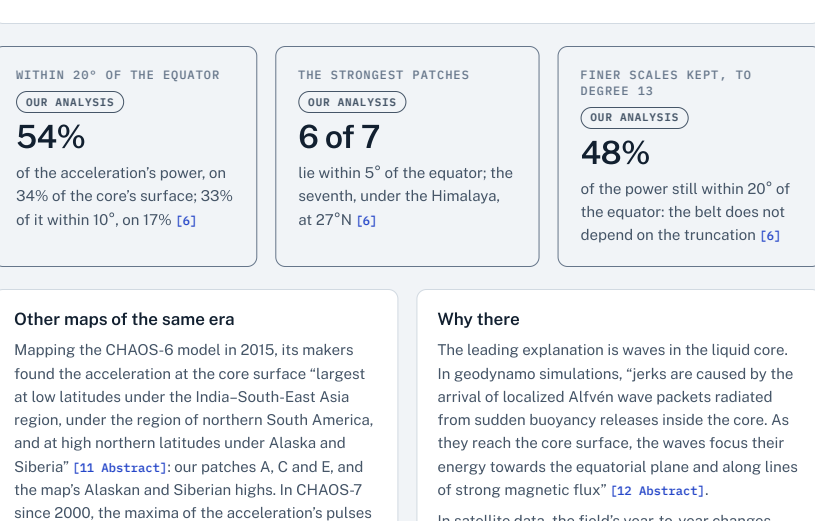
We computed the secular acceleration of the radial field at the top of the core in CHAOS-8.5, and its root-mean-square strength in each cell, averaged over 2000–2025. The map is our own re-run [6].

How strongly the field accelerated at the top of the core, 2000–2025



Our analysis of CHAOS-8.5, DTU Space's (CC BY 4.0) [6]: the root-mean-square acceleration of the radial field at the core surface, degrees 1–9.

Share of the acceleration's power, 2000–2025, in each band of latitude



Our analysis of CHAOS-8.5, degrees 1–9 [6]: each band's share of the acceleration's power at the core surface.

WITHIN 20° OF THE EQUATOR

OUR ANALYSIS

54%

of the acceleration's power, on 34% of the core's surface [6]

THE STRONGEST PATCHES

OUR ANALYSIS

6 of 7

lie within 37° of the equator [6]

Other maps of the same era

Mapping the CHAOS-8 model in 2015, its makers found the acceleration at the core surface "largest at low latitudes" [5]. The strongest acceleration of 2000–2020 in COV-OBS.x2 lies in the same equatorial belt [8].

Why there

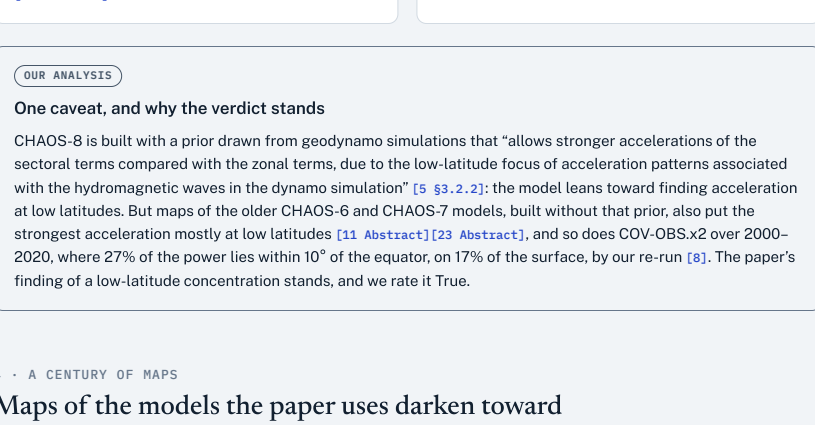
The leading explanation is waves in the liquid core: in geodynamo simulations, "jerks are caused by the arrival of localized Alfvén wave packets radiated from sudden buoyancy releases inside the core", and they reach the core surface near the equator [19 Abstract].

4 · A CENTURY OF MAPS

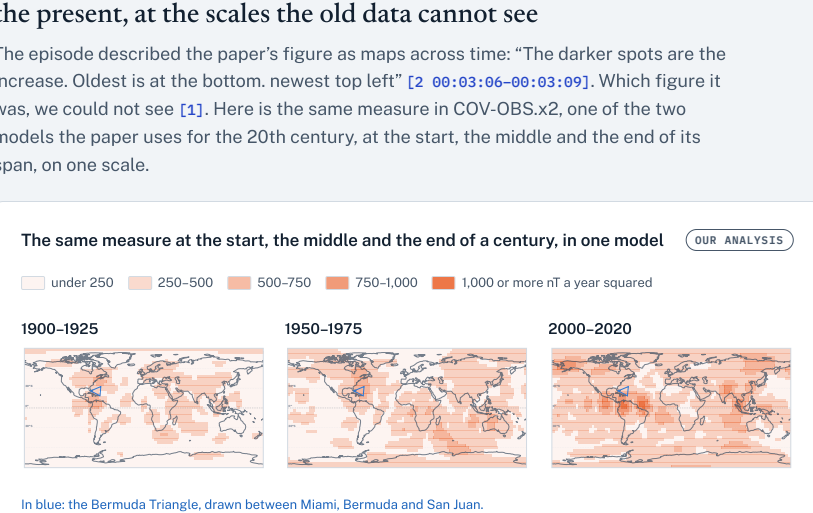
Maps of the models the paper uses darken toward the present, at the scales the old data cannot resolve

The episode described the paper's maps as showing an increase over the century.

The same measure at the start, middle and end of a century, in one model



Strength of the acceleration by decade



Up: the root-mean-square acceleration of the radial field at the core surface. Across: the year

Our analysis of COV-OBS.x2, the model of Huder and colleagues [8], and of CHAOS-8.5, DTU Space's (CC BY 4.0) [6]: the global root mean square over each decade or five years, plotted at its middle.

1900–1925 TO 2000–2020

OUR ANALYSIS

+70%

in the acceleration's overall strength in COV-OBS.x2, 241 to 409 nT a year squared; the share of the core surface above 250 rises from 30% to 82% [8]

LARGE SCALES, DEGREES 1–4

OUR ANALYSIS

79–112

nT a year squared, decade by decade since 1900: no trend [8]

THE SATELLITE ERA, CHAOS-8.5

OUR ANALYSIS

Peak 2010–15

514 nT a year squared, against 384 in 2000–2005 and 405 in 2020–2025 [6]

What the models' makers say about the early decades

Kalmag's makers: "At early times, between 1900 and 1920, only some limited amount of temporal scales of the SV up to SH degree ℓ=4 are resolved. The situation slightly improves between 1920 and 1960 where some signal up to SH ℓ=6 can be accurately recovered", while in the satellite eras "spatial scale up ℓ=15 can be partially resolved down to periods of approximately 5 years, and 2-year fluctuations can be very well captured up to ℓ=10" [9 Results]. COV-OBS.x2's makers: its splines, knots two years apart, do "not permit the capture of short time-scales features" [7 Results and discussion]. Even within the satellite era, the CHAOS-7 team advises truncating "the secular acceleration, which is more challenging to extract, at degree 9 (degree 15 after 2014)" [10 Conclusions].

The choice of model moves the numbers too. Over 2000–2020, CHAOS-8.5 shows 11% more acceleration than COV-OBS.x2 at degrees 1–9 and 73% more at degrees 10–14, by our re-run [6][8]; the CHAOS-8 team finds the same between its own versions: "These differences showcase the differing regularization methodologies adopted in CHAOS-8.1 and CHAOS-7.18" [5 §4.3].

OUR ANALYSIS

Why "growing power and coverage" misleads

The true part: in the models the paper uses, by our re-run, the recent maps are darker and their dark patches more widespread. The false impression: that this is a finding about the core. Almost all of the century's rise sits at degrees 5–14, fine scales the early data cannot resolve; the large scales, which they can, stay flat; and in the sharp satellite era the acceleration rose to 2010–2015 and fell back. COV-OBS.x2's mean model is pulled toward zero acceleration where its data are thin, because its prior has every coefficient but the axial dipole varying about zero [7 Methods]; so its early maps are fainter by construction.

What does change, in the abstract and in our re-run, is where the acceleration gathers: under the Caribbean and North America early in the century, with its strongest patches at 9°N 75°W and 41°N 67°W in 1900–1925, and at 29°N 67°W, inside the Bermuda Triangle, in 1950–1975; in the Pacific and Indian sectors after the 1970s, with the strongest patch of 1975–2000 at 7°N 83°E, off Sri Lanka; along the equator since 2000 [4][8]. Jerks were recorded throughout the century (section 2). Whether the paper reports a growth in power, and how it treats the early uncertainty beyond its abstract's note, we could not read [1].

5 · THE ANOMALY AND THE TRIANGLES

Not at the South Atlantic Anomaly, the old West Pacific Anomaly or the Dragon's Triangle; inside the Bermuda Triangle in 1950–1975, south of it now

The episode named four concentration points [2 00:03:20–00:03:29]; the abstract names none of them [4]. We measured the acceleration at the top of the core beneath each, in the models the paper uses.

How much of the core surface has weaker acceleration than directly beneath each place

PLACE	CHAOS-8.5, 2000–2025	THE SAME, TO DEGREE 13	COV-OBS.X2, 1900–1925	1925–1950	1950–1975	1975–2000	2000–2020
Bermuda Triangle, centre	81.6%	74.4%	81.3%	98.8%	99.7%	84.7%	91.7%
San Juan, one of its corners	89.8%	73.5%	94.5%	99.8%	98.1%	85.1%	95.3%
Dragon's Triangle, about 30°N 141°E	15.3%	68.6%	58.0%	39.4%	48.9%	48.1%	17.9%
Old West Pacific Anomaly core, about 13°N 115°E	76.5%	87.9%	80.0%	87.8%	33.7%	92.0%	84.7%

Our analysis of CHAOS-8.5 and COV-OBS.x2, degrees 1–9 unless stated [6][8]: the share of the core surface, by area, where the root-mean-square acceleration is weaker than directly beneath the place, 2,900 km down. 50% is the median; the strongest patches score close to 100%. The folklore regions have no fixed bounds, so we use a central point for each.

The South Atlantic Anomaly

The anomaly is the surface region where the field is weakest. In CHAOS-8.5 in 2025 it has two minima, 22,095 nT at 26.5°S 59.5°W, over northern Argentina near the border with Paraguay, and 23,452 nT at 40.5°S 0.5°W, south-west of Africa, by our re-run [6]; the CHAOS-7 team saw that second minimum develop "around 40° South on the Greenwich meridian" [10 Results]. Beneath the anomaly, at the core surface, lie patches of reversed flux "coinciding with the location of the SAA" [5 §4.5].

The anomaly has no single edge, and beneath it the acceleration is about average or weaker, depending on where the edge is drawn: 0.82 times the global level beneath the region where the surface field is below 26,000 nT, 0.96 times below 28,000 nT, and 1.08 times below 32,000 nT, the outline two of the paper's authors used in 2021, with 28,000 nT as their alternative [18 Methods and Results]; 0.79, 0.91 and 1.00 times at degree 13; and 0.70 times in the box the same authors drew around the anomaly's roots, by our re-run [6][18 Fig. 4]. Under no outline is it where the acceleration gathers: the strongest patch, under Colombia, is 2.8 times the global level, and the strong Atlantic and South American patches lie 32–35° of arc north of the anomaly's main minimum.

The authors' own earlier link

Two of the authors did tie the anomaly to jerks in 2021: minima in the acceleration of its area coincided with the jerks of the satellite era, and they concluded that "the SAA area is a region especially sensitive for the identification of geomagnetic jerks" [18 Discussion]. That is a link in timing, through the anomaly's growth, not a finding that the acceleration concentrates there; the new abstract puts the concentration at low latitudes [4]. Whether the new paper discusses the anomaly, we could not read [1].

The West Pacific Anomaly

The name exists in the literature, for a weak-field region of the past. "The WPA separated from the main anomaly between 1540 and 1550 AD and its core, located above the South China Sea between the Philippine Archipelago and current-day Vietnam, reached its minimal intensity around 1650 AD"; then the field's evolution caused "the WPA to shrink until disappearance after 1800 AD" [24 Introduction]. A conference abstract based on the gufm1 model dates it to 1620–1810 [25].

A 2026 conference abstract speaks of a less pronounced minimum "below the West Pacific", with no date in its text [26]. In CHAOS-8.5 in 2025 we find none: across 30°S–40°N and 100°E–180° the surface field is at least 32,919 nT, against 22,095 nT in the South Atlantic, by our re-run [6]. The old core lies over a moderately active part of the core today (76.5% in the table), and the strongest western Pacific patch is north of New Guinea, D on the map.

If the presenter meant today's active western Pacific rather than the published anomaly, that part comes closer to the paper: patch D is the fourth strongest on the core [6], the abstract names a Pacific sector [4], and the 2017 jerk was a Pacific event [20 Abstract].

The two Triangles

Both are folklore names with no official bounds. NOAA: "The Bermuda Triangle is a region in the western part of the North Atlantic Ocean in which ships, planes, and people are alleged to have mysteriously vanished"; "The U.S. Navy and U.S. Coast Guard contend that there are no supernatural explanations for disasters at sea", and "no official maps exist that delineate the boundaries of the Bermuda Triangle" [27]. In 1964 Vincent Gaddis gave its corners as Miami, San Juan and Bermuda, the outline we draw, though later writers did not always follow him [28]. The Dragon's Triangle, or Devil's Sea, is "a region of the Pacific, south of Tokyo", in a 1955 newspaper account from the Izu to the Ogasawara Islands [29].

In the models the paper uses, the acceleration beneath the Bermuda Triangle's centre is stronger than over at least four-fifths of the core surface in every period we mapped, at degree 9, and among the strongest 1–2% in 1925–1975 [6][8]. In COV-OBS.x2 in 1950–1975, before the satellite era and its sharper data [4], the strongest acceleration on the whole core lay inside the triangle, at 29°N 67°W: 736 nT a year squared, with the whole triangle at 1.7 to 2.4 times the global level [8]. The CHAOS-7 team noted that "an even stronger episode of acceleration change was seen at San Juan observatory around 1970" than the recent one in the Pacific [10 Results]. In 2000–2025, in CHAOS-8.5, the triangle ranges from 0.8 to 1.5 times the global level, and the strongest patch lies 23° to its south, under Colombia [6]. The Dragon's Triangle lies over an average-to-quiet part of the core at degree 9 in every period, and a little above average at degree 13.

OUR ANALYSIS

Why "Misleading"

Part of the claim holds, for one of the four places and one era: in COV-OBS.x2 the strongest acceleration on the whole core lay inside the Bermuda Triangle in 1950–1975, and the triangle's centre still lies over a more active part of the core than most [8][6]. The abstract, too, places the concentration in a few sectors, the Atlantic and the Pacific among them [4]. But the rest fails now. The South Atlantic Anomaly is not a concentration point: the acceleration beneath it is 0.8–1.1 times the global level, against 2.8 times at the strongest patch. The published West Pacific Anomaly disappeared after 1800 [24 Introduction]; read as today's active western Pacific, that part comes closer, as patch D shows. The Dragon's Triangle is ordinary; since 2000 the strongest patch lies 23° south of the Bermuda Triangle; and the Indian sector, which the abstract names and which probably holds two of the seven strongest patches, goes unmentioned. "Exactly as we expect them to be" cites no prediction, and the abstract makes none [4]. Acceleration 2,900 km down has no known bearing on ships or aircraft.

6 · NO COLLAPSE, NO POLE SHIFT

The equatorial field is changing by 1% in 25 years, and the paper's record says nothing of a pole shift

The episode introduced the paper as "a new data point on the worsening situation of Earth's ongoing magnetic pole shift" [2 00:00:18–00:00:22] and read its maps as "a full equatorial collapse" [2 00:03:13–00:03:20]. Neither is in the paper's record or abstract [3][4], and the models the paper uses contradict the second.

ALONG THE EQUATOR, 2000–2025

OUR ANALYSIS

−0.99%

34,153 to 33,814 nT at the surface, the same as the worldwide average, 42,623 to 42,200, in CHAOS-8.5 [6]

ALONG THE EQUATOR, 1900–2020

OUR ANALYSIS

−3.8%

35,243 to 33,897 nT, less than the worldwide 6.1%, 45,032 to 42,283, in COV-OBS.x2 [8]

THE DIPOLE, 1900–2020

OUR ANALYSIS

−7.2%

in COV-OBS.x2, in line with the axial dipole's loss of about 9% since 1840 [30 p. 1]

In the episode's words

Quoted from the automatically generated transcript; "Dragons Triangle" is its spelling.

> *"today we've got big [clears throat] stories on the ozone, solar storm deaths, and a new data point on the worsening situation of Earth's ongoing magnetic pole shift."*
>
> The presenter, opening the episode [2 00:00:15–00:00:22]

> *"And now our top story. We are back at the ongoing magnetic pole shift of Earth. And this team had the goal of tracking every last little bit of geomagnetic jerk evidence there is and relating it to secular variation of the field."*
>
> The presenter, on this paper [2 00:02:45–00:02:57]

> *"zooming in on there we can see that earth has completely lost the plot. The wheels are coming off almost coming completely off the rails in a full equatorial collapse."*
>
> The presenter, on the paper's maps [2 00:03:11–00:03:20]

OUR ANALYSIS

"A data point on a worsening shift": Misread

The paper studies where and how the core field's acceleration is organised. By its record and abstract it does not mention a pole shift, a reversal or an excursion, and what it reports is persistence, a few long-lived structures whose relative strengths change [3][4]. Its 2000–2025 model shows no worsening: the acceleration peaked in 2010–2015 [6]. The premise itself, "A pole shift is under way", is rated Misleading on our review of October 20: the axial dipole is about 9% weaker than in 1840 [30 p. 1], the field is "probably not reversing" [31], and no excursion is expected for centuries (our review of the forecasts; the field's decline). A real paper cited for what its record and abstract do not say is a misreading.

OUR ANALYSIS

"A full equatorial collapse": False

What the paper maps near the equator is acceleration, the change in the field's rate of change, gathered in structures that persist for decades [4], the signature of waves and fast flows at the top of the core (section 3). The field itself is not collapsing there: along the equator it weakened 0.99% in 25 years, as much as everywhere else, and over the century less than the world as a whole [6][8]. The evidence contradicts the claim.

The episode's statements beside the paper

THE EPISODE SAID	THE PAPER'S RECORD, ABSTRACT AND MODELS	OUR VERDICT
"a new data point on the worsening situation of Earth's ongoing magnetic pole shift" [2 00:00:18–00:00:22]	No pole shift in the record or abstract; persistence, not worsening [4]; the acceleration peaked in 2010–2015 [6]	MISREAD
"this team had the goal of tracking every last little bit of geomagnetic jerk evidence there is and relating it to secular variation of the field" [2 00:02:50–00:02:57]	An analysis of three global field models, relating the acceleration's regions to jerks [4]	CONTEXT
"we've gone from sparse moderate accelerative events 120 years ago to increasing power and coverage of the variation anomaly" [2 00:02:57–00:03:04]	Darker recent maps, from sharper data at fine scales; large scales flat; a satellite-era peak in 2010–2015 [8][6]	MISLEADING
"earth has completely lost the plot ... in a full equatorial collapse" [2 00:03:13–00:03:20]	The equatorial field fell 0.99% in 2000–2025, as much as worldwide [6]	FALSE
"Concentration points are the South Atlantic anomaly in Bermuda Triangle and then on the West Pacific anomaly and the Dragons Triangle exactly as we expect them to be." [2 00:03:20–00:03:29]	0.8–1.1 times the global level beneath the anomaly, by its outline [6]; no West Pacific Anomaly since 1800 [24 Introduction]; the Dragon's Triangle ordinary; the strongest patch on the core inside the Bermuda Triangle in 1950–1975, 23° south of it now [8][6]; the Indian sector left out	MISLEADING
"the extinction risk of magnetic pole ships like the one we're in now" [2 00:03:33–00:03:35]	Not in the abstract [4]; rated on our review of the episode	See that page

Quotations from the episode are from its automatically generated transcript, with the times at which each begins and ends [2]; "pole ships" is its rendering of pole shifts. The episode's own framing is rated on our review of the episode.

7 · REPEAT OUR RE-RUN

One script, two public model files, about half a minute

Every number from our re-run in the text comes from what one script prints, a few by simple arithmetic on it (percentage changes, ratios and distances); the script also writes the grids behind the maps and the latitude chart. It needs only Python 3.

PY

sa_cmb.py

Reads CHAOS-8.5 and COV-OBS.x2, computes the acceleration at the top of the core and the field at the surface, prints the numbers behind every re-run figure in the text and, with `--grids`, writes the grids the maps and the latitude chart are drawn from · 21 KB

Run it

Download `CHAOS-8.5_spline-coefficients.dat` from the CHAOS-8.5 section of DTU Space's CHAOS-8 archive [6] and `COV-OBS.x2-int` from DTU Space's COV-OBS.x2 page [8], put them beside the script, and run `python3 sa_cmb.py`. It checks both files against the SHA-256 checksums of the copies we used, then prints its results in five parts, in about half a minute on a laptop. Run as `python3 sa_cmb.py --grids grids`, it also writes the grids behind the maps and the latitude chart, as CSV files, to a folder named grids.

How we checked it

Our code reproduces the International Geomagnetic Reference Field: CHAOS-8.5 at 2020.0 matches its definitive 2020 coefficients to within 0.5 nT in the six we compared, and our evaluation of the reference field at 0°N 120°E on August 25, 2025 matches the British Geological Survey's calculator to the nanotesla [32]. The global pulses of acceleration it finds in CHAOS-8.5, peaking in 2006, 2009, 2012–2013, 2016 and 2021–2022, match those reported from other models [22 Abstract][16 §1] and [21 Abstract], the 2016 one by two of the paper's authors [18 Discussion]. Kalmag, the third model the paper uses, could not be downloaded: its site did not answer.

8 · LIMITS

Where this check could be wrong

We could not read the paper

Its figures, epochs, regions, numbers and caveats are unverified; every verdict rests on its record, an index copy of its abstract, its public models and the literature [1][4]. If its text reports a real growth in the acceleration's power, and rules out the data as the cause, "Overstated" would fit the second claim better than "Misleading".

Our maps are not the paper's

We use degrees 1–9 (and 13 as a check), the radial component and a root mean square over fixed periods; the paper's truncation, its changes of acceleration and its component analysis are its own, and we did not use Kalmag [1][9].

Single places depend on the truncation, and the anomaly on its outline

Beneath the Dragon's Triangle the acceleration is weaker than over about 85% of the core surface at degree 9, and stronger than over 69% at degree 13. Beneath the South Atlantic Anomaly it is 0.70 to 1.08 times the global level as the outline widens from 24,000 to 32,000 nT. The broad pattern holds throughout: the equatorial belt, and acceleration about average or weaker beneath the anomaly, never a concentration point [6].

Looking down through the mantle

Mapping the field down to the core assumes the mantle conducts too little to matter, and the finest scales there are the least constrained: the acceleration's spectrum rises with degree at the core surface, "which means that less well constrained shorter wavelength structures dominate" [10 Results].

A model's mean, not its spread

For COV-OBS.x2 we used the mean model, not its four-gigabyte ensemble of realisations, so its uncertainty is argued from its makers' statements and the flat large scales rather than shown [7].

Index copies

The paper's abstract and three others reached us only through an index; we paraphrase them and quote none [4][15] and [17][22].

What would change these verdicts

01 The paper's text: its figures, epochs and regions, any numbers for a change in the acceleration's power or extent, and its own caveats.

02 A rise in the large-scale acceleration over the century, or a sustained rise through the satellite era, in independent models.

03 A forecast, published before the paper, that the acceleration would concentrate at the South Atlantic Anomaly or under the two Triangles.

Prepared by Fact-Checked Science from the paper's record and an index copy of its abstract, the episode's transcript, the literature cited and our own re-run of two public field models. No figure or text comes from the paper, which we could not read. The assessment is our own and has not been reviewed by the authors.

Related checks

FALSE The 2025 model already failing? The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For the paper [1] we could read only its bibliographic record [3] and an index copy of its abstract [4], so no locator points into its text and nothing from it is quoted. For the episode [2], times are positions in the video (hours:minutes:seconds), from the first to the last transcript line of each quotation. For the other sources, § gives a numbered section and Fig. a figure, p. a page, and Abstract, Introduction, Methods, Methods and Results, Results, Results and discussion, Discussion and Conclusions name those parts of a source; where only an abstract was read, the entry says so, and abstracts read only through an index are so marked. Years are those of the printed issue where there is one, otherwise of online publication. Links checked October 25, 2026.

1. Serrano, M., Campuzano, S. A., and Pavón-Carrasco, F. J. (2026). Persistent regional patterns of secular acceleration at the core–mantle boundary and their relation to geomagnetic jerks over the past 125 years. *Physics of the Earth and Planetary Interiors* 381, 107615. Online October 5, 2026; volume dated December 2026. Peer reviewed; open access, CC BY 4.0. We could not read it: ScienceDirect met our tools and a real browser with a CAPTCHA, which the site's rules do not let us pass, and we found no other copy. Abstract only, from an index copy [4], paraphrased on this page and not quoted; no figure is redrawn.

2. SpaceWeatherNews (S0) (October 24, 2026). Earth Field Chaos, Solar Storm Deaths | S0 News Oct.24.2026. YouTube video, https://www.youtube.com/watch?v=e526hqAnTwg. Quoted from the automatically generated transcript; times are positions in the video. The label "Growing/Spreading Jerk Variation" is the episode's own, on its link to the paper in the video's description.

3. Crossref. Metadata record for doi:10.1016/j.pepi.2026.107615. Retrieved October 25, 2026: record created October 5, 2026; volume 381, article 107615, issued December 2026; 49 references; funders the Community of Madrid (PIPF-2022/TEC-25005) and Spain's Ministry of Science and Innovation (RYC2023-044408-I and PID2024-159020NB-I00); CC BY 4.0 for the version of record; no abstract deposited.

4. OpenAlex. Work W7220411698. Retrieved October 25, 2026: publication date October 5, 2026; open access at the publisher, no repository copy; the authors' affiliations; and the paper's abstract, held as an index copy, which we paraphrase.

5. Kloss, C., Finlay, C. C., Olsen, N., Tøffner-Clausen, L., Gillet, N., and Grayver, A. (2026). The CHAOS-8 geomagnetic field model. *Earth, Planets and Space* 78, 21. CC BY 4.0. We read the full text.

6. Kloss, C., Finlay, C. C., Olsen, N., Tøffner-Clausen, L., Gillet, N., and Grayver, A. (2026). CHAOS-8 geomagnetic field model, version 8.5 (data set). Zenodo; distributed by DTU Space: release of February 2, 2026, with satellite data to December 2025, the file CHAOS-8.5_spline-coefficients.dat from the CHAOS-8 archive. CC BY 4.0. The model the paper uses for 2000–2025, re-run by us.

How this was checked

Corrections and changes

Change log