☑ Fact-Checked Science

PAPER CHECK · PLANETS

Uranus- and Neptune-like fields swing in simulations; no change has been measured

Six researchers ran 15 dynamo simulations and found that electrical conductivity falling toward the top of the dynamo region gives fields like those Voyager 2 saw at Uranus and Neptune, with tilts that can swing by tens of degrees in decades [1 p. 2][1 p. 4]. No such change has been measured: each planet has been measured in place once, and the paper says none has been "established unequivocally" [1 p. 4]. We re-ran the authors' public data: the main result holds, and the 84° and 13° reproduce, as one window each from a wider range on a clock set by an assumed conductivity. On November 4, 2026, S0 News linked the University of Texas's release about the paper [2][3].

By Fact-Checked Science · Published November 4, 2026 · Updated November 6, 2026

OUR ANALYSIS marks our own reasoning and calculations, including every number from our re-run of the authors' deposit, and the verdicts are our assessment. Everything else comes from the numbered sources. Tilt changes on this page are simulated unless we say otherwise. In the paper [1], p. gives a page of the journal's PDF, and Fig. and Table a figure or table.

A result that reproduces, about simulated dynamos; no change has been measured at either planet

OUR ASSESSMENT

None

change in either planet's field has been measured. Each has been measured in situ once, and "no temporal variation has been established unequivocally" [1 p. 4]

83.5°, 12.6°

our re-run of the paper's 84° and 13° from the authors' own deposit [6]. They reproduce, in models, as one 40-year window each from a wider range. Our analysis

22–31°

a typical 40-year tilt change in the top models at the paper's assumed 10^4 S/m, and 3–5° with its clock rescaled to 10^5 S/m. A rescaling, not a new simulation. Our analysis

THE CLAIMS

TRUE

In simulations, electrical conductivity that falls toward the top of the dynamo region is a pathway to Uranus- and Neptune-like fields

The paper's main finding, paraphrased [1 p. 2]

Runs with uniform conductivity stay dipole-dominated; runs where it falls outward turn multipolar and, briefly, match the planets' patterns [1 p. 3]. It reproduces from the authors' deposit: uniform runs never reach the paper's match thresholds, and real snapshots pass them about 2–10 times as often as scrambled fields with the same power, most clearly in Model 6. Our analysis. The paper calls conductivity "a critical ingredient" [1 p. 1] and "a key ingredient" [1 p. 3], offers "a pathway" [1 p. 2], and calls its M1 peak "non-unique" [1 p. 6]; "drives" in the title goes a step further. See section 2.

TRUE

"the dipole tilt would shift by 84° over 40 years"; "is projected to be 13°"

The paper, on Models 11 and 6 [1 p. 4]

Both reproduce from the deposit: 83.5° and 12.6° (12.4° in the journal's coarser source data [7]). But these are the models, on an assumed clock, and one window each from a range: 40-year windows starting anywhere in the same two intervals give 60–84° and 13–46°. The paper presents the two as contrasts, and it says plainly that both fast and slow change can occur. Our analysis; see section 4.

UNCONFIRMED

"the southern auroral emission appears to shift latitudinally by ~30° between 1989 and 2023"

The paper's introduction [1 p. 2]

The authors hedge it: whether this reflects a change in the field "remains uncertain" [1 p. 2]. It measures a 2023 image against a footprint from Voyager's field model, not against a 1989 image [5 p. 11]. The Webb paper it cites calls the feature "consistent with the expected latitude location", and notes that a solar-wind push may shift such emission [8 Main]. The two aren't in conflict: one asks whether the emission falls where the 1989 field model allows, the other where its centre sits, and Henrik Melin is an author of both [1 p. 13]. See section 3.

OVERSTATED

"Wacky Magnetic Fields of Ice Giants Explained"

The release's headline [3]

The release's own text is careful: conductivity "may be key for explaining" the fields [3]. The paper calls it "a key ingredient" [1 p. 3], offers "a pathway" beside other proposed mechanisms [1 p. 2], and calls the M1 peak "non-unique" [1 p. 6]. The headline goes further than either. See section 7.

1 · WHAT THE PAPER DID

Fifteen simulated dynamos, scored against Voyager 2's one look at each planet

Voyager 2 found that Uranus and Neptune have magnetic fields "unlike those of any other known planet" [1 p. 1]. Chi Yan and five colleagues asked what inside the planets could make such fields, and how fast they might change. The University of Texas's Jackson School announced the work in a release [3].

STEP 1

Simulate

Fifteen runs of the open-source MagIC code: a rotating shell of conducting fluid at three thicknesses, with conductivity either uniform or falling outward in one of three ways [1 p. 2][4 p. 17]. Like all such models they can't reach a planet's conditions: the Ekman number is 10^{-4}, with one run at 3×10^{-5} [1 p. 6].

STEP 2

Carry the field to the surface

Each field is continued outward for dynamo depths of 0.7, 0.75 and 0.8 of the planet's radius. These are assumed: "not independently fitted" [1 p. 9].

STEP 3

Score against Voyager

Each snapshot gets a misfit against published field models, to spherical-harmonic degree 3, at its best polarity and longitude. The 100 best snapshots across the models set one score; the time-averaged "M1 peak" sets another [1 pp. 8–10].

STEP 4

Turn model time into years

Years come from an assumed conductivity of 10^4 S/m and the shell's size. The authors call the results "order-of-magnitude illustrative values" [1 p. 10].

The paper's terms, in plain words

TERM	WHAT IT MEANS HERE
Dipole tilt	The angle between the field's best-fitting bar magnet and the rotation axis: 59° at Uranus and 47° at Neptune at Voyager 2's passes [1 p. 8]
Multipolar	Much of the surface field sits in patterns more complex than one bar magnet [1 p. 1]
M1 peak	More power in a pattern that goes once around the planet (order m = 1) than in the axisymmetric part (m = 0); f_{M1} is the ratio [1 p. 3]
Misfit	The rms difference between a snapshot's surface field and the observed one, both scaled to the same size [1 p. 9]. By our arithmetic, 0.54 means a correlation of about 0.85
Uranus-like, Neptune-like	A snapshot with a misfit under 0.54 or 0.68 [1 p. 7][4 p. 11]
Secular variation	A planet's internal field changing over time [1 p. 1]
HB96, AH5, O8	The published field models the paper scores against: HB96 for both planets (Holme and Bloxham), AH5 for Uranus (Herbert, which also uses Voyager's auroral data), O8 for Neptune (Connerney and colleagues) [17 Abstract] [16 Abstract] [19 Abstract]

The paper's record

Peer reviewed in *Communications Physics*: received February 6 and accepted August 18, 2026 [1 p. 10], and published November 3 [1], under CC BY 4.0 [1 p. 13]. Six authors, at the University of Texas at Austin, UCLA, Imperial College London and Northumbria University [1 p. 1]. Funded by the University of Texas Institute for Geophysics, NASA and the UK's STFC; the authors declare no competing interests [1 p. 13]. They publish their data and scripts [6], and the journal publishes the reviewers' reports [5]. That openness is why we could re-run this at all.

We read the full text, its Supplementary Information and the review file. We re-implemented the analysis from the deposit and ran no simulation.

2 · WHAT HOLDS UP

The paper's main result stands up in the authors' own data

Let conductivity fall toward the top of the dynamo region and the simulated field turns multipolar; keep it uniform and a nearly axial dipole dominates [1 p. 3]. We re-ran that from the deposit, and it holds.

UNIFORM CONDUCTIVITY

OUR ANALYSIS

Never

Models 0, 4 and 8 never reach either match threshold. Their lowest misfits, over every deposited snapshot and all four field models, are 0.70–1.01, against thresholds of 0.54 and 0.68 [6]. Model 8's record is short, about 1,500 years on the clock.

FALLING CONDUCTIVITY

OUR ANALYSIS

Briefly

In the top models, 0.4–1.5% of the published snapshots pass the Uranus threshold against HB96, and 0.7–2.5% against AH5; 2–5% pass the Neptune one against HB96, and 2.6–6.8% against O8 [6]. The paper calls these "brief intervals" [1 p. 4].

AGAINST SCRAMBLED FIELDS

OUR ANALYSIS

About 2–10×

Real snapshots pass the thresholds about 2–10 times as often as fields with the same power in each degree and random patterns [6]. The excess is clearest for Model 6, and each count rests on 1–11 episodes.

OUR ANALYSIS

A stricter test, and what doesn't rest on it

Rotate each degree's coefficients once for the whole slice, so its time structure and episodes survive, and repeat 400 times. Scrambled runs reach Model 6's share of matches in at most 1.5% of draws, against each of the four field models. Yet the share for Model 11's single Uranus-like episode, where the 84° comes from, is 19–30%, what that chance gives [6]. The strongest result doesn't rest on this test: uniform-conductivity runs never reach the thresholds.

OUR ANALYSIS

What reproduces

Rebuilt from the deposit's coefficients: all 12 reference-by-depth tables of Supplementary Tables 2 and 3, to their printed digits [4 pp. 15–16]; the rows of Table 2 for the top models, column by column, where the one slip is Model 10's Elsasser number, 1.87×10^{-4} against a printed 1.8 [1 p. 3]; and every cell of Table 3 [1 p. 10]. The published misfit series come out to within 0.00001, using the deposit's recipe (see section 9). So does Figure 3's point: the best matches, at misfits of 0.454 and 0.536, worsen to 0.694 and 0.868 after 32 years [1 p. 4][6]. Rows for the thick-shell Models 2 and 3 and the short control Model 8 don't fully reproduce from the deposited tags; none is a top model. These are careful, checkable numbers.

Why a falling conductivity is more than a tweak

By the paper's account, some earlier ice-giant dynamos made multipolar fields far stronger than the planets are thought to have, while its σ_2 and σ_3 runs reach Elsasser numbers near the estimated 10^{-4} [1 p. 2][1 p. 3]. Conductivity that rises with depth is expected from how ices behave under pressure [1 p. 4], and the authors argue the pathway needs no fine tuning [1 p. 6]. They test that: at a lower Ekman number Model 12's M1 peak is "sustained", Models 13–14 show "a similarly weak dependence on supercriticality" [1 p. 6], and varying the score's tolerance and the number of best snapshots leaves its top set unchanged [1 p. 10].

OUR ANALYSIS Those tests mostly hold. Across σ_{rms} of 0.1–0.3 and the top 50–200 snapshots, medium and thin shells with varying conductivity fill the top three in 230 of 240 cells; thick-shell Model 2 enters in the other 10, against O8 at A = 0.75 and 0.8 with the top 50. The swings hold in Model 12 too: a median of 28° in 40 years, against 23° for Model 7, which it extends [6].

In the authors' words

The paper's own hedges are clear, and they are the fair way to read it. SV is secular variation.

> *"Changes in the intensity and/or orientation of Uranus' and Neptune's magnetic fields are therefore plausible over more than 30 years since the Voyager 2 flybys, though the extent of any such variation remains poorly constrained observationally as each planet has been measured in situ only once."*
>
> Yan et al. (2026), abstract [1 p. 1]

> *"no temporal variation has been established unequivocally, although potential time variability in auroral emission locations suggests that SV may be possible."*
>
> Yan et al. (2026) [1 p. 4]

> *"We note that the M1 peak remains a non-unique characteristic and does not by itself define ice-giant-likeness."*
>
> Yan et al. (2026) [1 p. 6]

Other routes to such fields

As the paper sets them out: a thin convecting shell over a stable layer, or over a large poorly conducting core [20][21]; and convection vigorous enough to weaken rotation's grip [22][1 p. 2]. A 2024 paper has ices separating into layers, leaving a thin dynamo region [23 Abstract]. A 2020 review, with one of this paper's authors, found no model yet able to explain the fields fully [24 Abstract].

OUR ANALYSIS So "a pathway" is the careful phrase, and "drives" in the title goes a step further even than "a critical ingredient" [1 p. 1].

OUR ANALYSIS

How much is fit, how much prediction?

Fit, with Voyager's fields in hand: nine variable-conductivity runs, three depths, two reference fields a planet, free polarity and longitude, and thresholds set near each planet's best misfit [4 p. 11]. The score's M1 term is what keeps thick-shell runs out of the top family, as the paper says [1 p. 4]. With one flyby per planet there's nothing to hold out, which is no fault of the authors. Unforced: the multipolar fields and the m = 1 peak appear when conductivity varies and, in these runs, never when it doesn't. Prediction: none tested yet. What would test it is in section 11.

3 · MODELLED AND MEASURED

The swings are in the simulations; no measurement shows one

The paper calls changes in both fields "plausible" over the more than 30 years since the Voyager 2 flybys [1 p. 1]. Showing directly that either field has changed would take a second measurement in place, and there isn't one. The evidence for or against any change since Voyager 2 is thin, and the paper says so [1 p. 4].

What has been observed

EVIDENCE	WHAT IT SHOWS	WHAT IT CAN'T SHOW
The field itself	Measured in situ once per planet, by Voyager 2: Uranus in 1986, Neptune in 1989 [1 p. 1] [1 p. 2] [1 p. 4]	Any change at all: there's no second measurement
Uranus's aurora	Bands the authors compiled in review: ~50° to ~60° (Voyager 2, 1986), ~30° to ~45° (Hubble, 2014), ~25° to ~45° (Keck, 2016), ~40° to ~50° (Webb, 2023) [5 pp. 10–11]. The paper: "at broadly similar locations", with "approximately 10–20° of latitudinal uncertainty" [1 p. 2]. An Anonymous Referee: "almost exactly in the same place" [5 p. 1]	A change smaller than those wide bands, with different instruments and wavelengths in each. We read only the abstracts of the four papers: [16], [15], [14], [13]
Uranus's poles, tracked	Hubble followed them from 2011 to 2022 and got one rotation period, 17.247864 ± 0.000010 h [12 Abstract]. The paper notes that this work "assumed that its magnetic field has remained static since 1986" [1 p. 1]	A steady east–west drift. As reviewer Tom Stallard notes, it "is effectively invisible": it "would appear as a constant rotation rate" [5 p. 5]
Neptune's aurora	One Webb observation, on June 22, 2023, with a bright feature at southern mid-latitudes [8 Main]	Change since 1989: Voyager 2 had "only very tentative evidence" of ultraviolet aurora [8 Main]. See below

Neptune: two sentences about one figure

The first cites the second's paper. H_3^+ is the ion Webb sees.

> *"At Neptune, however, the southern auroral emission appears to shift latitudinally by ~30° between 1989 and 2023, though whether this reflects secular variation of the magnetic field remains uncertain."*
>
> Yan et al. (2026) [1 p. 2]

> *"The location of the bright H_3^+ emission feature is consistent with the expected latitude location of the southern auroral oval"*
>
> Melin et al. (2025) [8 Main]

What each is comparing

Melin and colleagues place the feature between 60° S and 30° S and map the southern emission to field lines reaching from under 3 to 20 Neptune radii, on a Voyager-era field model [8 Main][8 Fig. 4]. Yan and colleagues explained their comparison to a reviewer: Webb's emission spans about −40° to −70°, so its centre lies about 20–30° poleward of the footprint of one of those lines, L = 20, at −30° to −40° on the Voyager-era field model [5 p. 11].

OUR ANALYSIS So the ~30° is the top of that range, and it's an offset from a modelled line, not a change between two images.

OUR ANALYSIS

Not a contradiction, and not a measurement of change

Both sentences come from people reading one figure, and Henrik Melin is first author of one paper and a co-author of the other [1 p. 13]. One asks whether the emission falls where a 1989 model allows; the other asks where its centre sits. Another possible cause: a propagation model, with arrival times uncertain by weeks, puts the observation during a rise in solar-wind pressure, "the sixth strongest predicted during 2023", and that may push emission to lower L shells [8 Main]. The authors grant that solar wind can move aurorae and say a field change "cannot be ruled out" [5 p. 11]. That's the right size for the claim: Unconfirmed.

The models aren't a forecast

A reviewer suggested starting a run from the Voyager field. The authors replied that this would need data assimilation beyond the study, and that "No specific simulation epoch corresponds to the Voyager flyby" [5 p. 27].

OUR ANALYSIS So 84° isn't a statement about what Uranus did after 1986. It's what a simulated dynamo did after it briefly resembled Uranus.

OUR ANALYSIS

Neither outcome is excluded, on the paper's clock

Over Uranus's real baseline of 37 years, against HB96, 46% of windows starting in a Uranus-like state move 20° or less (7% move 10° or less; median 24°). Against AH5, which also uses Voyager's auroral data, 75% move 20° or less (47% move 10° or less; median 12°). Over Neptune's 34 years, against HB96, 38% of Neptune-like windows move 20° or more and 23% move 30° or more (median 14.5°); against O8, 43% and 32% (median 17°) [6]. So a steady Uranus and a shifted Neptune both fit somewhere in the models. That's the paper's position, and it's why the models can't yet say which happened.

No shift has been measured at either planet. The paper says a shift is plausible, on its assumptions; it doesn't say one has happened.

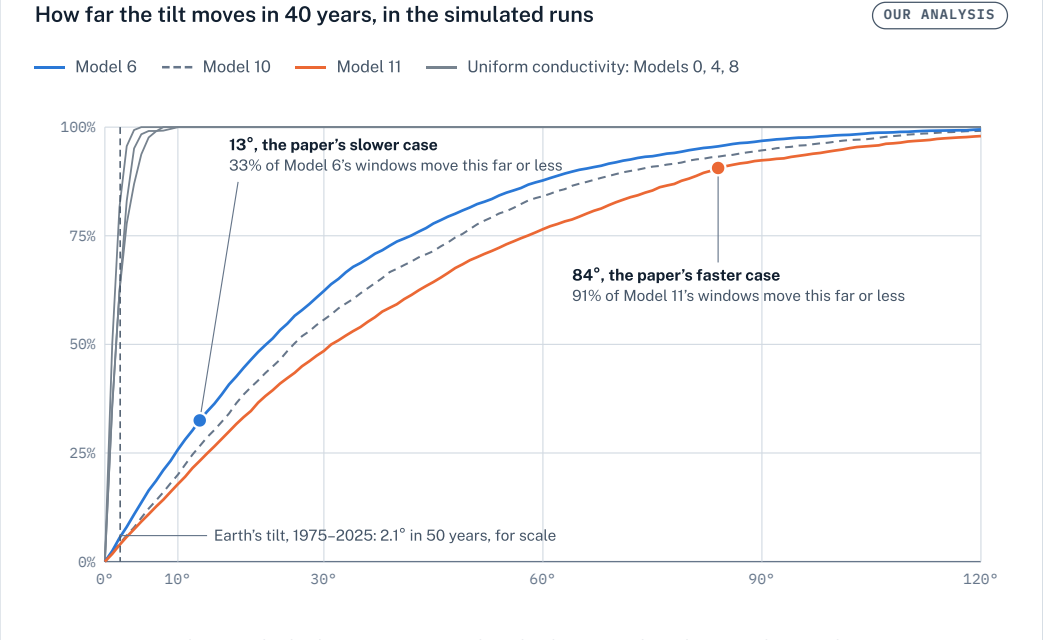
4 · OUR RE-RUN

84° and 13° reproduce, as one window each from a wide range

We wrote the rules before computing any tilt-change statistic: a 40-year window starting at every snapshot of all 15 models, on the paper's clock, measuring the change in tilt between its ends. The deposit holds the Gauss coefficients; we read them as data and ran none of its scripts [6].

How far the tilt moves in 40 years, in the simulated runs

OUR ANALYSIS



Change in dipole tilt over 40 years. Height is the share of windows that move this far or less

Our analysis of the authors' deposit [6], CC BY 4.0, on the paper's clock at 10^4 S/m (Uranus, A = 0.7) [1 p. 10]. Earth from IGRF-14 [9]. Not redrawn from a figure in the paper. The data are in ice-giant-end40-ecdf.csv.

40-year tilt changes over the whole deposited runs, on the paper's clock

Model	Shell χ, profile	Over 10°	Over 30°	Over 60°	Median	5th–95th percentile
6	0.5, σ_2	74% (71–78)	38% (33–42)	12% (10–15)	22°	2–81°
10	0.6, σ_2	80% (77–83)	44% (39–51)	16% (12–21)	26°	2–91°
11	0.6, σ_3	82% (79–85)	52% (46–57)	24% (19–28)	31°	3–101°
9	0.6, σ_1	61% (49–74)	32% (23–42)	12% (8–17)	16°	1–82°
7	0.5, σ_3	75% (72–80)	40% (33–48)	13% (9–19)	23°	2–79°
0, 4, 8	All three, uniform σ_0	0%	0%	0%	1.0–1.6°	0.1–5°

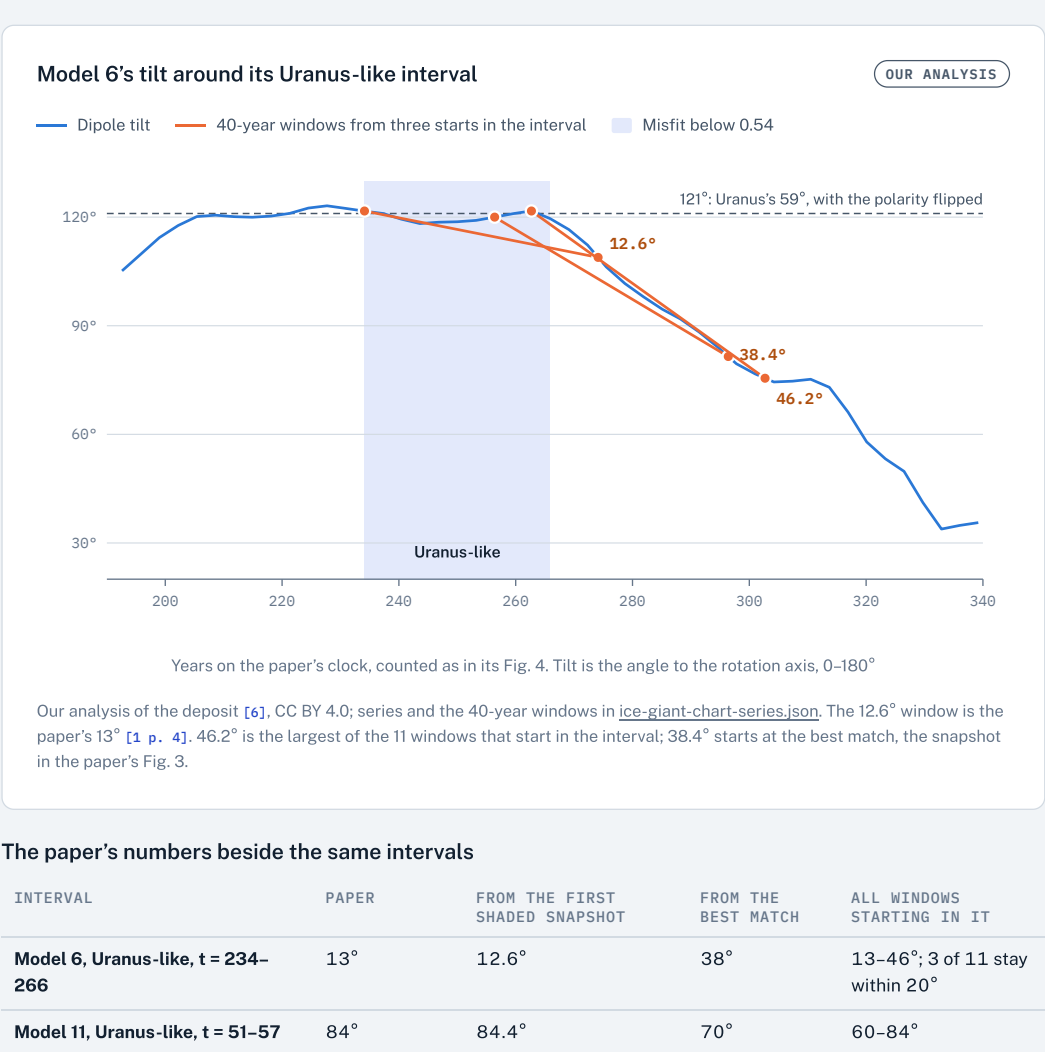
Our analysis of the deposit [6]; 95% block-bootstrap intervals in brackets; the top three models in bold. Each run holds 188–465 non-overlapping 40-year windows for the top three. The Neptune clock lowers the medians by 7–13%. So the lead author's "tens of degrees within decades" [3] is a fair account of a typical window in these models, on this clock.

One window each, from a range

The paper's numbers are right. Each matches, to within about 2°, a 40-year window starting at the first shaded snapshot of an interval. The paper doesn't state that rule, and it matters: Model 6's 13° holds only near the opening of its interval, and section 9 shows how that opening can move.

Model 6's tilt around its Uranus-like interval

OUR ANALYSIS



Years on the paper's clock, counted as in its Fig. 4. Tilt is the angle to the rotation axis, 0–180°

Our analysis of the deposit [6], CC BY 4.0; series and the 40-year windows in ice-giant-chart-series.json. The 12.6° window is the paper's 13° [1 p. 4]. 46.2° is the largest of the 11 windows that start in the interval; 38.4° starts at the best match, the snapshot in the paper's Fig. 3.

The paper's numbers beside the same intervals

INTERVAL	PAPER	FROM THE FIRST SHADED SNAPSHOT	FROM THE BEST MATCH	ALL WINDOWS STARTING IN IT
Model 6, Uranus-like, t = 234–266	13°	12.6°	38°	13–46°; 3 of 11 stay within 20°
Model 11, Uranus-like, t = 51–57	84°	84.4°	70°	60–84°
Model 9, Neptune-like, the more pronounced interval	about 11°	12.8°	5.5°	0–20°
Model 11, Neptune-like, first in Supp. Fig. 9	56° (top of range)	56.1°	66°	56–69°
Model 11, Neptune-like, second		31.2°	24°	5–31°
Model 11, Neptune-like, third	26° (bottom of range)	28.3°	54°	28–59°

Paper's figures [1 p. 4]; ours from the deposit, on its Uranus clock for the first two rows and its Neptune clock for the rest [6]. Read at exactly 51–91 and 234–274 years on the axis of the paper's Fig. 4, as in the panel above, the deposit gives 83.5° and 12.6°, and the journal's own source data give 83.5° and 12.4° [7].

OUR ANALYSIS

Typical, or the ends of a range?

The paper offers them as contrasts, so this is no charge against it. But 13° is the lowest of Model 6's 15 windows that start in a Uranus-like state, in the published slice (median 38°), and 84° is the highest of Model 11's 4. Against whole runs, 84° sits at Model 11's 91st percentile and 13° at Model 6's 33rd. Model 6 isn't a slow model, either: its other Uranus-like episode, outside the paper's 500-year window, moves 78–111°.

OUR ANALYSIS

Tilt alone understates the motion

In Model 11's 84° window the tilt swings over a 115° range, and the axis, counting longitude, turns 163°: close to a full change of polarity. Meanwhile the dipole's share of surface power goes from 41% to 12% and up to 63%. Model 6's 13° is 29° of axis motion. Over 40 years, the median axis moves 45–75° in the top three models.

Windows that start in a Uranus-like or Neptune-like state: few, and they depend on the reference field

REFERENCE FIELD, MODELS	WINDOWS	SEPARATE EPISODES	OVER 10°	OVER 30°	OVER 60°	MEDIAN	FROM EACH EPISODE'S BEST MATCH
Uranus, HB96: 6, 10, 11	28	4	96%	50%	25%	30°	111°, 38°, 16°, 70°
Uranus, AH5: 6, 10, 11	53	6	57%	19%	8%	12°	31°, 111°, 17°, 4°, 13°, 2°
Neptune, HB96: 9, 6, 10, 11	117	18	75%	31%	5%	17°	median 14°; 3 of 17 over 30°
Neptune, O8: 11, 6, 10	127	20	70%	33%	6%	18°	median 17°; 7 of 19 over 30°

Our analysis of the deposit's misfit series and the paper's thresholds [6][4 p. 11]. HB96 is Holme and Bloxham's field model, AH5 Herbert's, which also uses Voyager's auroral data, and O8 Connerney's [17 Abstract] [16 Abstract] [19 Abstract]. One Neptune episode in each row, Model 10's last, runs too near the record's end for a 40-year window from its best match, so the last column counts 17 and 19. Against HB96, Model 11's Uranus-like start moves 60–84°; against AH5 it moves a median of 9°. So being fast or slow isn't a fixed property of either model. Over every deposited snapshot the Uranus episodes number 7 (HB96, median 38°) and 16 (AH5, median 11°).

5 · WHERE THE YEARS COME FROM

The years rest on an assumed conductivity, and the paper says so

Simulations run in their own time units. Nobody has measured the conductivity deep inside either planet, so "over 40 years" carries that assumption with it. The authors say these are "order-of-magnitude illustrative values" [1 p. 10].

The chain, from the paper's Methods

Magnetic diffusion time $\tau_\lambda = \mu_0 \sigma D^2$, with shell thickness $D = (1 - \chi)R$ and $\sigma = 10^4$ S/m, "the standard ionic water estimate" [1 p. 10][1 p. 9]. Across the shells, depths and planets in its Table 3, that is 19–71 kyr [1 p. 10]. Conductivity itself is less settled: the paper quotes values "at or above 2×10^3 S/m" and plots up to 10^5 S/m [1 p. 2][1 p. 9]. It weighs a clock from flow speed instead and keeps this one because flow speed "is not directly constrained" [1 p. 10].

OUR ANALYSIS

Worked through

Model 6 at Uranus (χ = 0.5, A = 0.7): D = 8,946 km, τ_λ = 31.9 kyr. One unit of model time is τ_λ divided by the magnetic Prandtl number of 5, or 6,373 years, as the deposit's scripts have it [6]. So one snapshot is 3.2 years and 40 years is 12.6 snapshots. For Model 11: D = 7,157 km, τ_λ = 20.4 kyr, about 2.3 years a snapshot. The clock uses the conductivity at the inner boundary, the highest in each profile [1 p. 8].

The same simulated series on three clocks: 40-year tilt change, whole run

Model	$\sigma = 2 \times 10^3$ S/m	$\sigma = 10^4$ S/m (the paper's)	$\sigma = 10^5$ S/m
6	**36°**; 83% over 10°, 57% over 30°	**22°**; 74% over 10°, 38% over 30°	**2.9°**; 9% over 10°, 0.4% over 30°
10	**35°**; 85% over 10°, 55% over 30°	**26°**; 80% over 10°, 44% over 30°	**4.7°**; 19% over 10°, 0.8% over 30°
11	**39°**; 86% over 10°, 60% over 30°	**31°**; 82% over 10°, 52% over 30°	**4.3°**; 19% over 10°, 1.5% over 30°

Our analysis of the deposit [6]; bold is the median. **This is a rescaling of one set of runs, not a new simulation.** The paper does the same for its "~500 years" at 10^5 S/m, and told a reviewer it presents that (then ~250 years) "as a scaling argument rather than as a new self-consistent high-conductivity simulation" [1 p. 6][5 p. 14]. At 10^5 S/m its 40-year window is 1.3–2 snapshots long. At 10^6 S/m it's shorter than the spacing, so we give no number.

OUR ANALYSIS

The method isn't absurd

Put Model 0, a dipole-dominated run with an Earth-like shell, on Earth's numbers ($\sigma = 10^6$ S/m, a 2,260 km shell, so $\tau_\lambda \approx$ 203 kyr). Over 50 years it gives a median change of 0.4°, a 95th percentile of 1.2° and a top of 1.95° [6], close to Earth's record of 0.03–2.10° [9]. So in this one test the clock gives about the right size for Earth. What's unknown is σ at the ice giants.

OUR ANALYSIS

The paper's slow case, checked

Its "within 5° change over ~500 years" at 10^5 S/m is at most 5° in 50 years on the 10^4 clock [1 p. 6]. That reproduces: a 4.9° range, for windows starting at t = 205–215 [6]. It's a rare state, as the paper's "only transiently" says: 0.9% of Model 6's 50-year windows stay within a 5° range.

6 · WHAT A POLE MEANS HERE

Most of each field lies outside the dipole, so a "pole" means less

A dipole tilt is a single number for a field that a single bar magnet describes poorly. The paper's word is "dipole tilt" throughout, and that's the careful choice [1 p. 4].

THE AXIAL DIPOLE'S SHARE OF SURFACE POWER

OUR ANALYSIS

9–14%

at Uranus and Neptune, from the published field models [17], [16], [19]; about 90% at Earth in 2025 [9]. The paper gives 12%, and 74–98% for other planets [1 p. 1].

NEPTUNE'S STRONGEST OUTWARD SPOT

OUR ANALYSIS

110°

from the dipole's outward pole, in the other hemisphere from it. At Uranus it's 45–64°; at Earth, 28°. All to degree 3 or 4, from the field models and IGRF-14 [17], [16], [9].

POLARITY CHANGES PER 1,000 YEARS

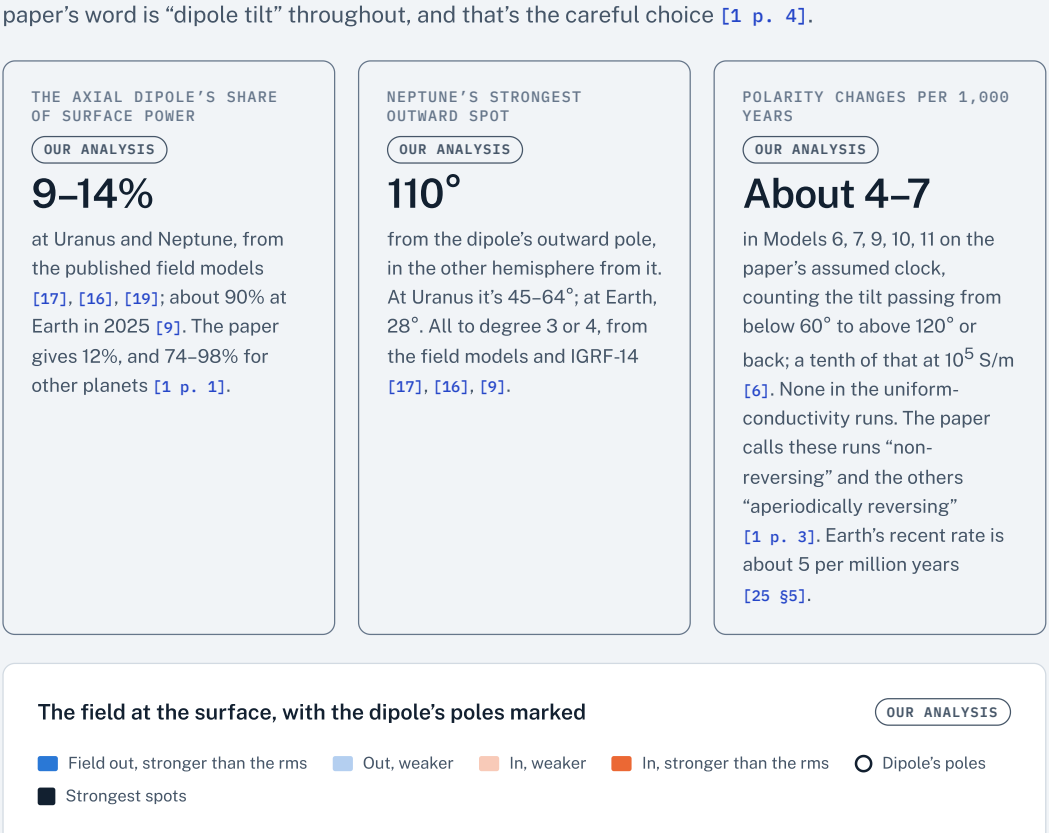
OUR ANALYSIS

About 4–7

in Models 6, 7, 9, 10, 11 on the paper's assumed clock, counting the tilt passing from below 60° to above 120° or back; a tenth of that at 10^5 S/m [6]. None in the uniform-conductivity runs. The paper calls these runs "non-reversing" and the others "aperiodically reversing" [1 p. 3]. Earth's recent rate is about 5 per million years [25 §5].

The field at the surface, with the dipole's poles marked

OUR ANALYSIS



Our own maps of the radial field to degree 3, from published coefficients: HB96 for Uranus and Neptune [17 Abstract] and IGRF-14 for 2025 [9]. Hammer projection, north at the top, with longitude in each model's own system. A + marks field pointing out, a − field pointing in. On a dipole-dominated planet the ring and the square of each sign lie fairly close; at Neptune the two + marks are 110° apart, while the two − marks nearly coincide.

OUR ANALYSIS

Large swings often mean a weak dipole

In Models 6, 7, 9, 10 and 11, 40–62% of 40-year tilt changes over 60° pass through a dipole below half its usual strength, against 11–25% of changes under 10° [6]. The median dipole holds only 25–41% of the surface power at degrees 1–3. When the dipole is small, its axis can swing without the whole field changing as much. The paper makes the same link from the other side: "Periods of weaker SV coincide with intervals where the dipole component remains relatively strong and stable" [1 p. 4].

7 · THE RELEASE AND THE PAPER

The release's text is mostly careful; its headline isn't

The Jackson School's release keeps most of the paper's "could" and "may". "Explained" is where it runs ahead.

The release, line by line

THE RELEASE SAYS [3]	WHAT WE FOUND (OUR ANALYSIS)
"Wacky Magnetic Fields of Ice Giants Explained"	Overstated. The paper calls conductivity "a key ingredient" and offers "a pathway", and its M1 peak is "non-unique" [1 p. 2] [1 p. 3] [1 p. 6]
"may be key for explaining their unusual magnetic fields"	Fair, and it echoes the paper's "a key ingredient" [1 p. 3]
"could change substantially within decades, and may be configured differently than they were during the Voyager 2 mission"	Close to the paper's "plausible" and "can, in some intervals" [1 p. 1][1 p. 6], on its assumed clock. The paper's "if confirmed" isn't carried over
Aurorae "can hold clues about whether the dipole has shifted"	Fair, as a question; no shift has been measured [1 p. 4]
"Earth's magnetic tilt drifts by only a degree or so over 50 years"	Fair. In IGRF-14 the change over each 50-year span from 1900 runs from 0.03° to 2.10°, median 0.6°; 1975 to 2025 is the largest, at 2.10° [9]
"In some stretches the tilt swings by tens of degrees within decades. In others it shifts only slightly over the same span."	True of the models on this clock: median 22–31°, 5th percentile 2–3°; see section 4
Earth's dipole is "tilted relative to its rotational axis by only 11 degrees"	IGRF-14 gives 11.3° in 1975, 10.5° in 2000 and 9.21° in 2025 [9]
Uranus's dipole "tilted by 59 degrees and Neptune's by 47 degrees"	Yes: 58.6° and 47° in the Voyager-era models [18 Abstract][19 Abstract]
Tom Stallard "reviewed the paper for the journal"; "We are busy working on what's contained within these observations"	Yes, and the review is signed: the journal thanks Stallard by name [1 p. 13][5 p. 3]. Stallard says the analysis is under way, in a sentence that speaks of "how the magnetic fields have changed"; no change has been measured [1 p. 4]. Our search found no published result on whether either field has changed

What the public review file shows

The journal publishes the reviewers' reports and the authors' replies. The submitted title was "A Rapidly Evolving Dynamo Consistent with Uranus' and Neptune's Magnetic Fields" [5 p. 2]; the authors changed it after the second round of reports [5 p. 50]. In the abstract, "Rapid temporal evolution is a hallmark of these non-dipolar dynamos" became the present "These non-dipolar dynamos exhibit substantial temporal variation, although the rate fluctuates and can be transiently slow" [5 p. 50][1 p. 1]. One Anonymous Referee wrote at first that the claim of rapid change "is not convincingly supported and is overstated" [5 p. 2], then that it "remains too strong" [5 p. 7], and on the last version that it was "appropriately qualified" [5 p. 8].

8 · A POLE SHIFT ON EARTH?

The fast swings come from multipolar dynamos; nothing in the paper points to a pole shift at Earth

Not from this paper. Its fast tilt swings and frequent polarity changes come from its multipolar runs, the ones like the ice giants (sections 4 and 6). Earth's field is dipole-dominated, and the paper mentions it only as a comparison; the release does no more [1][3].

What the word search found in the paper

- **"pole" or "poles" as a word:** none. Every "pole" is inside "dipole", "quadrupole" and the like.
- **"shift":** four times: Neptune's aurora, two on the dipole tilt, and a run order [1 p. 2] [1 p. 4] [1 p. 6] [1 p. 10].
- **"geomagnetic", "excursion", "reversal":** once each, in one background sentence: "the geomagnetic field undergoes reversals, excursions, westward drift, and sub-decadal 'jerks'" [1 p. 4].
- **"reversing":** twice, of the models themselves: "non-reversing" of the uniform runs and "aperiodically reversing" of the others [1 p. 3].
- **"Earth":** twice in the text, for its weak m = 1 power and for its core's conductivity [1 p. 1][1 p. 10].
- **"solar":** the solar wind on the magnetospheres, and "Solar System" [1 p. 4][1 p. 6].

OUR ANALYSIS

Nothing here points to a change at Earth

The paper's range belongs to multipolar dynamos. Earth's is dipole-dominated: the axial dipole holds about 90% of its surface power [9], and the paper groups it with the planets at 74–98% [1 p. 1]. The paper's own dipole-dominated runs move 1.0–1.6° in a typical 40-year window on the same fast clock and never change polarity in the deposited runs [6], as the paper's "non-reversing" says [1 p. 3]. That doesn't mean an Earth-like field never reverses: Earth's does, about 5 times per million years recently [25 §5], and it has excursions too, as the paper notes in passing [1 p. 4]. Nothing in the paper bears on when the next might come. And all of this concerns magnetic fields: nothing in the paper moves a planet or its rotation axis. Our guide to Earth's field sets out what Earth's field is doing, and how a pole's drift differs from an excursion or a reversal.

9 · A NOTE ON THE DEPOSIT'S SCRIPTS

The morphology scripts appear to drop a factor of √2; that changes the order of some top models, and no tilt

We found this while reproducing the misfit series. It isn't in our verdicts, and we have not put it to the authors. If they have a reason for it, we'll correct this.

OUR ANALYSIS

What the deposit's scripts appear to do

The deposit's morphology, secular-variation and Figures 3–4 scripts appear to divide every m > 0 Gauss coefficient by √2 before use, with the comment "Remove MagIC's sqrt(2) normalization for m>0" (`analysis_morpho_rms_timeseries.py`, line 13) [6]. A comment in another script says the aim is the "standard (non-MagIC) Schmidt convention" (`analysis_morpho_rms_timeseries_basic.py`, line 140) [6], so the step is deliberate. But in MagIC's own code, at the commit the paper names, that √2 is the step that gives Schmidt-normalised coefficients [11], the form in which the Voyager-era fields are published [19 Abstract]. And the undivided values are the ones that agree with MagIC's own time-series output, which in the three runs whose two files share time stamps (Models 3, 7, 11) its tilt to a median of about 0.000004° and its energy share to a median of better than 1 part in 10^7; divided, the tilt is off by a median of 7–8°, up to 9.9°, and the energy share by 16–19% [6]. In Supplementary Data 2, labelled Schmidt, the "most Uranus-like" snapshot's coefficients imply a tilt of 129.2° [7]; MagIC's own tilt there is 120.6° [6].

The observed-field files aren't the reason: as filed they give tilts of 59–60° for Uranus and 45–47° for Neptune, in line with the published 59° and 47°, and divided they would give 49–51° and 35–37° [6]. And the deposit's f_{M1}, unlike its misfit, keeps the undivided values, so it uses both forms whichever is right: dividing would halve f_{M1}, and Table 2's p_{M+1} and p_{l+1} reproduce only undivided [6]. If this is what it appears to be, the misfit weighs the models' m > 0 power at half against the observed fields.

What it changes

The order among the top models at some depths. For Uranus against HB96 at A = 0.8, for example, Models 6, 11, 10 become 11, 7, 6. The misfits move by up to 0.11, typically about 0.02. Model 11 gains a slow Uranus-like episode, of 7 snapshots whose 40-year windows move 1.7–29°, 15° from its best match; against HB96 the latter in the stricter test of section 2, with scrambled runs reaching its share in 4% of draws rather than 30% [6]. Figure 3's model maps and Figure 4's coefficient panels use the divided values. Figure 4's shading, misfit and SV panels and Supp. Figs 9 and 12 also use them; the SV timescales change little, typically by a few percent [6].

What it doesn't

The tilt series. The paper's 84° and 13° stand for the years it names, though the shaded intervals' edges move by a snapshot, and a window from the new first shaded snapshot moves about 93° (Model 11) and 8° (Model 6) [6]. The main conclusion, since uniform-conductivity runs still never reach a threshold. The family of top models, medium and thin shells with varying conductivity: it holds on the total score, though on the snapshot score alone a thick-shell run (Model 1) leads for Neptune, and the M1 score is what keeps it out, as the paper says [1 p. 4]. Model 6's best snapshot stays its best (misfit 0.454 becomes 0.461).

10 · REPEAT OUR NUMBERS

One script fetches the deposit and IGRF and recomputes everything marked "Our analysis"

The rules came first; the file also logs what we added after seeing results. The deposit stays at figshare and the script fetches it, reads the zip in place and runs nothing from it.

PY **ice_giant_numbers.py**
Downloads the inputs and recomputes every number; needs numpy · 59 KB

JSON **ice-giant-numbers.json**
Its output: the clock, whole runs, the paper's numbers, like stretches, rescaling, Earth, the chance tests, the rankings and their grid, Table 2, the SV timescales · 171 KB

CSV **ice-giant-end40-ecdf.csv**
The share of 40-year windows up to each tilt change, all 15 models · 19 KB

JSON **ice-giant-chart-series.json**
Model 6's tilt around its interval, and the surface maps · 24 KB

TXT **RERUN_RULES.txt**
The rules, written before any tilt-change statistic, with the zip's hash, then the additions in the order they were made, those from this page's fresh review last · 13 KB

Run it

```
python3 -I ice_giant_numbers.py <folder>
```

downloads about 140 MB into that folder, checks the hashes, reads it as data and writes its three outputs next to the script. It takes a few minutes once the files are there. If a server refuses a download, the script names the file to fetch by hand.

The data and their credit

The deposit and the paper's Supplementary Data: Yan et al., CC BY 4.0 [6][7]. Please cite them. **IGRF-14:** IAGA Working Group V-MOD, through NOAA's National Centers for Environmental Information [9]. **Field models:** Holme and Bloxham, Herbert, and Connerney and colleagues, as the deposit transcribes them [17 Abstract] [16 Abstract] [19 Abstract].

11 · LIMITS

What we couldn't check

The physics

We reanalysed output and ran no simulation. Whether runs at these Ekman numbers scale to real ice giants is untested here; the authors and reviewers discuss it [1 p. 6][5 p. 2].

Rescaling

Our other clocks assume, as the paper does, that a change in bulk conductivity only stretches time and keeps the morphology [5 p. 42]. No run tests that.

The auroral locations

Uranus's bands come from the authors' reply in the review file, and we read only abstracts of the underlying papers [16], [15], [14], [13]. We didn't measure the centre of Neptune's emission in Melin's Fig. 4: the L = 20 ring and the bright emission look as the reply says, but that's by eye [8 Fig. 4].

Thin samples

Uranus-like windows come from a few episodes: in the published slice for the top three models, 4 against HB96 and 6 against AH5, and Supplementary Table 2's top 100 at A = 0.7 comes from 15 across all models. Treat their percentages as rough.

Other papers' detail

Stanley and Bloxham and Soderlund and colleagues appear only as this paper describes them; we read their records, not their text [20] [21] [22].

What would settle it

01

Webb's monitoring. JWST programme GO 7570 (PI Tom Stallard, Co-PI Henrik Melin) is approved to map H_3^+ at both planets every other day for 28 days. Among its hypotheses: "The Ice Giants' complex magnetic fields have drifted since Voyager", and that Neptune's aurorae differ "only because we observed Neptune during a solar wind compression" [10 Abstract]. A published result on either would change the Neptune verdict.

02

A second measurement in place. Nothing else directly tests a change in the field. The paper says secular variation can "inform planning for future missions" [1 p. 1], and the release says more missions "are necessary" [3].

03

Runs at other conductivities, and more at lower Ekman numbers (the paper's one, Model 12, keeps the M1 peak [1 p. 6]), rather than a rescaling, to see whether the morphology and the swings hold. The paper lists more of the physics as future work [1 p. 6].

The researchers plan to combine Webb's images, Voyager 2's field and dynamo runs to estimate how the fields might be configured today, according to the release [3].

Related checks

MISREAD **Uranus's poles "shifting"** The Disaster Cycle, Fact-Checked

MISREAD **Neptune's aurora and storms** The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For the paper [1], read in full, p. gives a page of the journal's PDF, and Fig. and Table a figure or table. In [4] and [5], p. gives a page of that PDF, counted from its first page. In [8], which we read as a web article without page numbers, Main and Fig. 4 name its parts. In [25], § is a section. Abstract marks the part of a source we rely on; a source marked "Abstract only" or "Record only" was read no further. S/m is siemens per metre, the unit of conductivity. Webb is the James Webb Space Telescope. Links checked November 4, 2026.

1. Yan, C., Soderlund, K. M., Aurnou, J. M., Cao, H., Masters, A., and Melin, H. (2026). Electrical conductivity structure drives anomalous and potentially time-varying magnetic fields at Uranus and Neptune. *Communications Physics* 9, 336. Received February 6, accepted August 18, published November 3, 2026. Peer reviewed. CC BY 4.0. Full text.

2. SpaceWeatherNews (S0) (November 4, 2026). Uranus/Neptune Pole Shift, New Nova Type (Again) | S0 News Nov.4.2026. YouTube video, https://www.youtube.com/watch?v=6cKdVgQIf90, published at 12:23 UT. No transcript was available.

3. Jackson School of Geosciences, University of Texas at Austin (November 3, 2026). Wacky Magnetic Fields of Ice Giants Explained. News release. Full text. Its images are not ours to host.

4. Yan et al. (2026). Supplementary Information for [1]. CC BY 4.0. Full text.

5. Communications Physics. Peer Review File for [1]: the reviewers' reports and the authors' replies, over three rounds. CC BY 4.0, with credit to "Anonymous Referee" where a reviewer is anonymous. Full text.

6. Yan, C., Soderlund, K., Aurnou, J. M., Cao, H., Masters, A., and Melin, H. (2026). Dataset for the "Electrical conductivity structure drives anomalous and potentially time varying magnetic fields at Uranus and Neptune", figshare, version 2. CC BY 4.0. The simulations' Gauss coefficients, diagnostics, derived misfit series, observed-field files and scripts, for all 15 models. We read all of it as data, ran none of its scripts, and re-implemented what we needed.

7. Yan et al. (2026). Source data for [1]: Supplementary Data 2 (Figure 3) and Supplementary Data 3 (Figure 4). CC BY 4.0.

8. Melin, H., Moore, L., Fletcher, L. N., Hammel, H. B., O'Donoghue, J., Stallard, T. S., et al. (2025). Discovery of H_3^+ and infrared aurorae at Neptune with JWST. *Nature Astronomy* 9, 666–671. CC BY 4.0. Full text, read as the publisher's web article; the paper's reference 15.

9. IAGA Working Group V-MOD (2024). International Geomagnetic Reference Field, 14th generation (IGRF-14): Gauss coefficients 1900–2025. Data file, NOAA National Centers for Environmental Information; retrieved November 4, 2026, the same file, by its SHA-256, as on our guide to Earth's field.

10. Space Telescope Science Institute. JWST Proposal 7570: Exploring the magnetic environments of Uranus and Neptune with JWST, Cycle 4 General Observer overview, created December 11, 2025. Read November 4, 2026.

11. MagIC developers. MagIC, the open-source dynamo code the paper uses, GNU GPL: coeff.py (the function getGauss) and magnetic_energy.f90 (theta_dip), at commit 8bdb98b, the version the paper names (git v6.3-96-g8bdb98b), read as text on November 4, 2026.

12. Lamy, L., Prangé, R., Berthier, J., Tao, C., Kim, T., Roth, L., et al. (2025). A new rotation period and longitude system for Uranus. *Nature Astronomy* 9, 658–665. Abstract only.

13. Melin, H., Fletcher, L. N., Hammel, H. B., Milam, S. N., Moore, L., Stallard, T. S., et al. (2025). The Ionosphere of Uranus as Revealed by JWST. *Geophysical Research Letters* 52, e2025GL118301. CC BY 4.0. Abstract only.

14. Thomas, E. M., Stallard, T. S., Melin, H., et al. (2025). Auroral and Non-Auroral H_3^+ Ion Winds at Uranus With Keck-NIRSPEC and IRTF-iSHELL. *Geophysical Research Letters* 52, e2024GL112001. CC BY 4.0. Abstract only.

15. Lamy, L., Prangé, R., Hansen, K. C., Tao, C., Cowley, S. W. H., Stallard, T. S., et al. (2017). The aurorae of Uranus past equinox. *Journal of Geophysical Research: Space Physics* 122, 3997–4008. Abstract only.

16. Herbert, F. (2009). Aurora and magnetic field of Uranus. *Journal of Geophysical Research: Space Physics* 114, A11206. The AH5 field model. Abstract only; coefficients as the deposit [6] transcribes them.

17. Holme, R., and Bloxham, J. (1996). The magnetic fields of Uranus and Neptune: Methods and models. *Journal of Geophysical Research: Planets* 101, 2177–2200. The HB96 field models. Abstract only; coefficients as the deposit [6] transcribes them.

18. Connerney, J. E. P., Acuña, M. H., and Ness, N. F. (1987). The magnetic field of Uranus. *Journal of Geophysical Research* 92, 15329–15336. Abstract only.

19. Connerney, J. E. P., Acuña, M. H., and Ness, N. F. (1991). The magnetic field of Neptune. *Journal of Geophysical Research* 96, 19023–19042. The O8 field model. Abstract only; coefficients as the deposit [6] transcribes them.

20. Stanley, S., and Bloxham, J. (2004). Convective-region geometry as the cause of Uranus' and Neptune's unusual magnetic fields. *Nature* 428, 151–153. Record only; described as [1] describes it.

21. Stanley, S., and Bloxham, J. (2006). Numerical dynamo models of Uranus' and Neptune's magnetic fields. *Icarus* 184, 556–572. Record only; described as [1] describes it.

22. Soderlund, K. M., Heimpel, M. H., King, E. M., and Aurnou, J. M. (2013). Turbulent models of ice giant internal dynamics: Dynamos, heat transfer, and zonal flows. *Icarus* 224, 97–113. Record only; described as [1] describes it.

23. Militzer, B. (2024). Phase separation of planetary ices explains nondipolar magnetic fields of Uranus and Neptune. *Proceedings of the National Academy of Sciences* 121, e2403981121. CC BY 4.0. Abstract only.

24. Soderlund, K. M., and Stanley, S. (2020). The underexplored frontier of ice giant dynamos. *Philosophical Transactions of the Royal Society A* 378, 20190479. Abstract only.

25. Olson, P., and Amit, H. (2015). Mantle superplumes induce geomagnetic superchrons. *Frontiers in Earth Science* 3, 38. CC BY 4.0. As our guide to Earth's field quotes it: about 5 reversals per million years since about 25 million years ago.

METHOD

How this was checked

On November 4, 2026, we read the release and the paper in full, with its Supplementary Information, its 59-page Peer Review File and its source data, and we downloaded the authors' figshare deposit (140 MB, CC BY 4.0), whose 15 models we read as data. We read the Webb paper on Neptune [8] in full, IGRF-14, the STScI overview of programme 7570, and the relevant functions of MagIC's source. Thirteen other papers were read only as abstracts or bibliographic records, as the source list marks. Every quotation was checked word for word against its saved source.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources. They cover how far the paper's simulated tilts move on its clock, how its two headline numbers sit in those distributions, the rescaling of its clock, the chance baseline for its match to the planets, what a "pole" means for these fields, and the note on the deposit's scripts. They rate the paper's simulations as simulations: we ran no dynamo and don't judge whether its physics scales to real planets, beyond what its authors and reviewers say.

One hosted script fetches the deposit, two source-data files and IGRF-14, and recomputes every number marked "Our analysis". We wrote the rules before computing any tilt-change statistic and logged what we added afterwards, in order, in a hosted file. The re-run reproduces the paper's 84° and 13°, its misfit series to within 0.00001, all 12 reference-by-depth tables of Supplementary Tables 2 and 3, Table 3, and the top models' rows of Table 2. Rows for the thick-shell Models 2 and 3 and the short control Model 8 don't fully reproduce from the deposited tags; none is a top model. After a fresh reviewer's re-derivation we added the items logged last in that file. We could not check the underlying auroral papers beyond their abstracts, or any conductivity at the planets themselves, which no one has measured.

On November 6, 2026, the page was revised to review the paper on its own. No transcript of the S0 News episode that linked the paper's release was available [2], and without one the site no longer comments on how an episode presented a paper. So the verdicts on the episode's title and the link's label were removed, and section 8 now asks what the paper means for a pole shift on Earth, drawing on what this check had already established. The verdicts on the paper's claims and on the release's headline are unchanged. A fresh review of the revision then added Earth's own reversals to section 8 and removed a pointer in section 11 to a verdict no longer on the page.

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

OVERSTATED Has some basis but claims much more than the evidence supports.

UNCONFIRMED Rests on a preliminary result that hasn't been confirmed.

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 6, 2026	Revised to review the paper on its own. No transcript of the S0 News episode that linked the paper's release was available, and without one the site no longer comments on how an episode presented a paper. The verdicts on the episode's title and the link's label are removed, and the verdicts on the paper's claims and the release's headline are unchanged. The page had no section on the episode; section 8, on Earth, now asks what the paper means for a pole shift there. The title and the panel's heading no longer answer the episode's title, and the summary, sections 1, 3, 7 and 11 and the source list no longer comment on the episode. A fresh review of the revision then added to section 8 that Earth's field does reverse, about 5 times per million years, and that the paper doesn't bear on when it next might; removed from section 11 a pointer to a verdict no longer on the page; and fixed smaller wordings in sections 3 and 7.
Nov 4, 2026	Published on factchecked.science after a full check against its sources. Built from the paper, its review file and source data, the release, and our own re-run of the authors' public deposit; the charts are our own analysis of that deposit, published field models and IGRF-14.

Fact-Checked Science is independent. It isn't affiliated with the channels, presenters or authors whose claims it checks.

Last updated Nov 6, 2026