Fact-Checked Science

PAPER CHECK · EARTHQUAKE PRECURSORS

Fifty years of magnetic surveys in Uzbekistan found anomalies with no earthquake link

On 22 October 2026, S0 News presented a conference paper from Uzbekistan's Institute of Seismology as a study of "the ways the Earth snitches on itself before big quakes" [2 00:01:57]. The paper reports fifty years of repeat magnetic surveys at 30 points around Tashkent and finds local anomalies of 3–50 nT that do not correlate with the region's released seismic energy [1 pp. 4, 7]. Its authors say such unexplained anomalies are commoner than precursors and make precursors harder to recognise [1 p. 9]. We checked what the episode said about it, the paper's own claims and what the peer-reviewed literature says about magnetic earthquake precursors.

By Fact-Checked Science · Published October 22, 2026

OUR ANALYSIS marks our own reasoning, and the verdicts are our assessment. Everything else comes from the numbered sources; for the paper [1], p. gives the page of its 11-page PDF and Fig. one of its six figures. Times such as 00:02:06 are positions in the episode's video [2].

A null result, presented as a pre-quake signal

OUR ASSESSMENT

0

earthquakes in the paper's 2004–2025 comparison that it links to any of its anomalies; it finds "no correlation" with the region's seismic energy [1 pp. 7–8]

3–50 nT

the size of the local anomalies, lasting from a few months to five years or more [1 p. 4]

1974–2025

repeat surveys at 30 points around Tashkent, 4–8 times a year, read against a base observatory [1 pp. 2–3]

THE CLAIMS

MISREAD

The Earth "snitches on itself before big quakes"

The presenter, introducing the two E3S papers [2 00:01:57]

This paper is about local magnetic changes that are not tied to earthquakes. Its authors compared them with the region's released seismic energy and found no correlation, and they say anomalies of unknown origin are detected far more often than precursor ones [1 pp. 7–9]. No earthquake in its 2004–2025 comparison is linked to an anomaly. See section 4.

TRUE

Geomagnetic anomalies "continue to receive attention"

The presenter [2 00:02:06]

They do: this paper, its authors' 2025 journal paper [7] and the programmes in Japan, China and California that it reviews [1 pp. 8–9]. But attention is not evidence, and much of it is sceptical: the paper itself cites a Parkfield study that found nothing before a magnitude 6.0 earthquake [10]. See section 6.

OVERSTATED

Atmospheric electricity signals are much better documented

The presenter [2 00:02:06]

Reports of ionospheric and atmospheric-electricity precursors are numerous, but the 2011 international commission on earthquake forecasting found their retrospective statistics "too weak to provide any probability gain" [19 p. 335], a test on 1,279 earthquakes found no significant change in the ionosphere's electron content before them [23], and a claimed 40-minute precursor turned out to be an artefact of the analysis [24]. See section 6.

PARTLY TRUE

No correlation between released seismic energy and the local anomalies

The paper's abstract and results [1 pp. 1, 7–8]

The part that holds: by eye, nothing in the two zone-averaged field curves answers the one large energy spike of 2004–2025 [1 Fig. 6]. The part that doesn't: the individual anomalies the sentence is about were never compared with anything, no correlation or test is computed, and 1974–2004 is left out. See section 5.

UNCONFIRMED

The anomalies are "a real and repeatable phenomenon in Uzbekistan"

The paper's abstract [1 p. 1]

They recur in the group's own surveys on two test sites over decades [1 pp. 7–8]. Most are "individual" to one point [1 p. 4], and the one change shared by nearly all 22 points of zone 1, a drift of about 28 nT over 2004–2023, is what a slow change at the reference observatory would also produce; the paper does not consider that. See section 5.

MISREAD

Han et al. found that their trial prediction "does not exceed the level of randomness"

The paper's review of other work [1 pp. 8–9]

The Kakioka study it cites reports the opposite: magnetic anomalies were likelier 6–15 days before sizeable earthquakes, with a probability gain of about 1.6 over a random (Poisson) model, and its authors say the data "clearly contain precursory information" [8]. The paper's "approximately 20%" figure could not be checked, because the study is paywalled. See section 5.

1 · WHAT S0 SAID

Four sentences, one about this paper

The episode covered three pre-earthquake papers in one 36-second passage: two from the same Uzbek conference volume and a journal paper on ionospheric data [2 00:01:51]. Only one sentence is about this paper, and the framing around it reverses what the paper found.

In the presenter's words

From the automatically generated transcript; "pre-earquake", "geoysical" and "doumented" are its errors for pre-earthquake, geophysical and documented.

> *"Up next is one and two of a triple on pre-earquake electromagnetic signals. E3S web conference series delivering a banger on the ways the Earth snitches on itself before big quakes through changes in various geoysical parameters."*
>
> S0 News [2 00:01:51]

> *"I'm glad to see geomagnetic anomalies continue to receive attention on top of the much more well doumented atmospheric electricity signals."*
>
> S0 News [2 00:02:06]

> *"This team thinks that by combining those various ionospheric and related data with solar signals, they have put together a working earthquake forecasting model. We need more of this."*
>
> S0 News [2 00:02:15]

Which paper each sentence fits

THE SENTENCE	FITS	WHY
"one and two of a triple on pre-earquake electromagnetic signals" [2 00:01:51]	Both E3S papers	This paper (article 01007) and a second from the same group (07003) sit in the same proceedings volume [3][6].
"the ways the Earth snitches on itself before big quakes through changes in various geoysical parameters" [2 00:01:57]	Mostly the other E3S paper	That paper discusses "the complex of earthquake precursors" across several parameters [6]. This one reports anomalies that "are not associated with seismic processes" [1 p. 9].
"geomagnetic anomalies continue to receive attention" [2 00:02:06]	This paper	Its subject is local geomagnetic anomalies [1 p. 1]. The comparison with "atmospheric electricity signals" is a claim about the wider literature, checked in section 6.
"a working earthquake forecasting model" from "ionospheric and related data with solar signals" [2 00:02:15]	The third paper	This paper uses no ionospheric or solar data and proposes no model. It says an anomaly can count as a precursor only when two or more methods show it at the same time [1 pp. 9–10].

The episode's line-up also promised "pre-seismic signals" [2 00:00:20]. The signals this paper studies are the ones with no seismic link [1 p. 9]. The other two papers are checked on their own pages.

2 · THE PAPER

A conference paper from Tashkent, reviewed within the conference

Seven authors, all at the Institute of Seismology of Uzbekistan's Academy of Sciences, published the paper in the proceedings of the School of Young Seismologists, held in Tashkent on 24–28 August 2026 [1 p. 1][3]. It is open access under CC BY 4.0 [1 p. 1].

Where it appeared

E3S Web of Conferences volume 745, article 01007, eleven pages, published online on 8 October 2026 in the section “Modern Approaches to Earthquake Forecasting” [3]. The volume holds 50 papers in eight sections, most of them, by their titles, about Uzbekistan, all published online on the same day; its guest editor is F. Boltaev [3].

The group has worked on this question for decades. The second author co-wrote a 1982 paper in the *Geophysical Journal of the Royal Astronomical Society* reporting a magnetic precursor of the 1978 Alay earthquake (M 7.0) from the institute’s Fergana test site [22], and the authors’ fuller account of the present anomalies appeared in the *Russian Journal of Earth Sciences* in 2025 [7].

How it was reviewed

E3S’s policy says “Editorial decisions and editorial processes are run by the editors of the proceedings who are members of the organizing committee of the event”, that “All published articles are peer reviewed” and that blinded review with several reviewers is encouraged “when it is possible” [5]. The volume’s Statement of Peer review, signed by the guest editor on 25 September 2026, certifies that “All articles have been subjected to peer review administered by the proceedings editors” by “expert referees” [4].

The guest editor works at the authors’ institute and co-authors three papers in the volume, including the other E3S paper the episode cited [3][6]. That is a normal arrangement for conference proceedings. It means the review was organised inside the conference rather than by an independent journal, and no reviewer names, submission dates or revisions are published.

AUTHORS

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all at the Institute of Seismology, Academy of Sciences of the Republic of Uzbekistan, Tashkent [1 p. 1]

FUNDING

1 project

“Identification of the nature of the manifestation of the precursors of strong earthquakes in time and space”; no funder or grant number, and no competing-interest or data statement [1 p. 10]

REFERENCES OUR ANALYSIS

13

listed, while at least nine works cited in the text, including the four critical studies it names, have no entry [1 pp. 8–11]

3 · WHAT THEY MEASURED

Thirty points, a base observatory, and differences of a few nanotesla

Since 1968 the institute has run a “geodynamic polygon”, a test site, around Tashkent, with magnetic profiles laid along and across the Karzhantau fault [1 p. 1]. This paper uses 30 of its repeat-survey points for 1974–2025 [1 pp. 2–3].

INSTRUMENT

0.1 nT

sensitivity of the absolute proton magnetometers, which measure the strength of the total field; “the error in detecting local anomalous variations did not exceed 0.5–0.8 nT” [1 p. 2]

VISITS

4–8 a year

along the profiles; points 2–3 to 5–7 km apart, placed in or near fault zones and away from power lines, railways, roads and industry [1 p. 2]

BASE OBSERVATORY

25–80 km

from the points: readings are taken “relative to the data of the Yangibazar Magnetic Observatory” [1 p. 2], the Tashkent observatory (code TKT), in operation since 1964 [27]

Two groups of points

Sorted by how their fields changed, 22 points form a first zone about 150 km long, 10–15 km wide in the west and up to 50 km in the east, and 8 points form a second zone, 8–15 km wide and about 75 km long, inside the first [1 p. 3][1 Fig. 2]. Extra points were added between 1974 and 2004 “to detail the identified local anomalous variations”, so most records are shorter than the full span: in the paper’s plots only a few points start in 1974 and many start in or after 2004 [1 p. 3][1 Fig. 3].

OUR ANALYSIS

What the observatory difference removes, and what it doesn’t

Taking each point’s reading relative to a base observatory is the standard way to cancel the field’s external variations, the daily cycle and magnetic storms, which are nearly the same at two sites tens of kilometres apart. What is left above the 0.5–0.8 nT error is called a local anomaly [1 p. 2]. The paper never defines an anomaly more formally, gives no statistical criterion, and does not say whether the readings are simultaneous, whether disturbed days are excluded, or how instrument drift and changes at the sites or at the observatory were controlled. Space weather is not mentioned at all.

4 · WHAT THEY FOUND

Anomalies of 3–50 nT, and no match with the region’s seismic energy

The points show changes “of varying intensity, shape, duration, and linear dimensions” [1 p. 4]. Averaged by zone and set beside the energy released by earthquakes in the area each year, they show nothing the authors could tie to seismicity [1 pp. 6–8].

SIZE

3–50 nT

“from 3–5 nT to 45–50 nT”; bay-shaped, sinusoidal, stepped or trend-like, the bay-shaped ones “completely reversible” [1 p. 4]

DURATION

3 months to 5 years

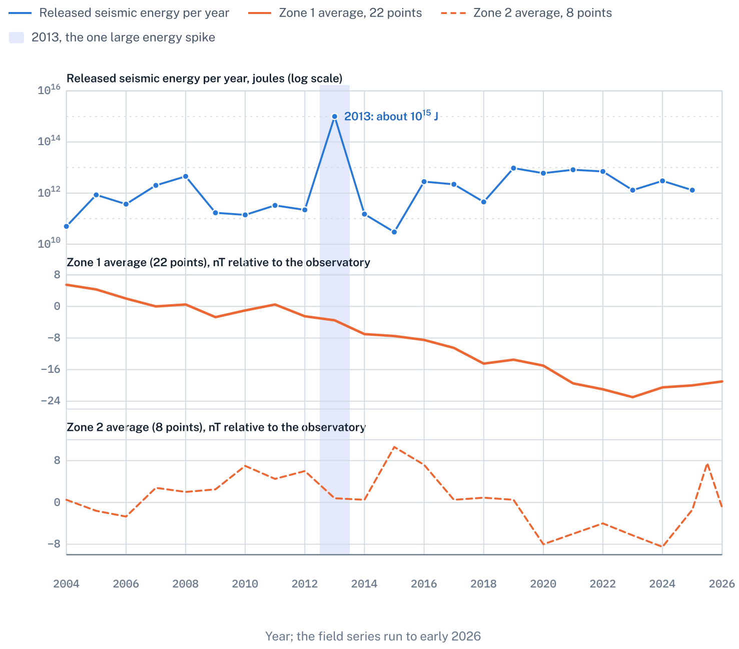
“from 3–6 months to 4.5–5.0 years or more” [1 p. 4]

ZONE 1’S DRIFT OUR ANALYSIS

≈28 nT

the fall of the 22-point average from about +5 nT in 2004 to about −23 nT in 2023, read from the paper’s figures [1 Fig. 5][1 Fig. 6]

Seismic energy against the two zone averages, 2004–2025



Adapted from Fig. 6 of the paper [1 Fig. 6], CC BY 4.0. The energies are the paper’s annual values for the area 40°–41.3°N, 68°–70°E, from the national earthquake catalogue, plotted in units of 10^{10} J [1 p. 6][1 Fig. 6]. Every value here was read by eye from the figure, at roughly annual spacing: the energies to within about a third, the field values to about 1 nT. The original’s year axis labels 2014 as 2011; we place its 22 energy points at equal spacing from 2004 to 2025, which puts the spike in 2013.

In the authors’ words

“Cove-shaped” is the paper’s term for a bay-shaped change that reverses completely.

> *“In most cases, changes in the geomagnetic field at one point are individual and do not coincide with changes at other nearby points.”*
>
> Makhsudov et al. (2026) [1 p. 4]

> *“As can be seen, the released seismic energy does not correlate with local anomalous variations in zones 1 and 2.”*
>
> Makhsudov et al. (2026) [1 p. 7]

> *“Anomalous variations of the geomagnetic field of unknown nature in the territories of geodynamic polygons of Uzbekistan are detected in the overwhelming majority of cases more often than precursor ones.”*
>
> Makhsudov et al. (2026) [1 p. 9]

The same thing in Fergana

On the institute's Fergana test site, surveys in 1979–1988 found similar anomalies at single points, groups of points and at three magnetic stations, whose anomalies lasted two months to a year and measured 2–4 nT, along with slow sinusoidal and trend-like changes over zones a hundred kilometres long [1 p. 7]. That recurrence is the basis for the abstract's "real and repeatable phenomenon" [1 p. 1].

What the authors make of it

The cause "remains unestablished" [1 p. 2]; given the variety of shapes and sizes, the sources "may be located at different depths in the Earth's crust, mantle and, possibly, even deeper" [1 p. 8]. The results are "the first stage" of finding out [1 p. 10]. Because unexplained anomalies are commoner than precursor ones, telling the two apart is harder, and an anomaly "can be considered a harbinger only if it manifests synchronously in time in the parameters of two or more methods" [1 pp. 9–10].

The paper says nothing about a pole shift, the decline of Earth's dipole, the May 2024 storm or a magnetic excursion, and it offers no forecasting method [1].

5 · OUR ANALYSIS

A comparison by eye, a drift shared by every point, and a misread source

The paper's central statement is fair as far as it goes, but it rests on less than it seems, and its account of the Japanese statistical study it cites is backwards.

OUR ANALYSIS

"No correlation" is a judgment by eye

The comparison is one chart: the annual seismic energy of a box 1.3° by 2° against the two zone averages for 2004–2025 [1 p. 6][1 Fig. 6]. The energy series is dominated by a single spike, about 10^{15} J around 2013, and neither field curve does anything special there, which supports the sentence. But no correlation coefficient, test or lag is computed; the averages smooth out the very anomalies the paper is about; the 1974–2004 surveys are never compared; and no individual anomaly is ever set against an individual earthquake. The chart's own year axis is mislabelled, with "2011" where 2014 belongs.

OUR ANALYSIS

The drift shared by nearly all 22 points

The paper says most changes are "individual" to a point [1 p. 4]. Yet nearly every one of the 22 zone-1 records declines by 10–40 nT between about 2010 and 2025, and their average falls by about 28 nT from 2004 to 2023 [1 Fig. 3][1 Fig. 5]. A change common to 22 sites 25–80 km from the observatory is what a slow change at the observatory itself, or a difference in the field's secular variation between the sites and the observatory built up over two decades, would look like. The paper does not consider either; it treats zone-wide changes as deep sources [1 p. 8]. We cannot say which it is. We can say the mundane explanations are not excluded.

OUR ANALYSIS

What Han et al. actually concluded

The paper writes that in Han et al.'s Kakioka study "approximately 20% of the selected earthquakes were preceded by a hypothetical type of magnetic anomaly" and that "The authors concluded that the trial prediction does not exceed the level of randomness" [1 pp. 8–9]. Han et al.'s abstract says anomalies "are more likely to appear before sizable earthquake events … especially 6–15 days before", that "The probability gain is around 1.6 against a Poisson model", and that the data "clearly contain precursory information" [8]. The sceptical reading belongs to Masci and Thomas, who reviewed Han et al. and saw no "significant evidence" of precursors [9]. The paper cites both, and attributes the sceptics' verdict to the proponents. The 20% figure is unchecked: the study is paywalled.

OUR ANALYSIS

Smaller slips

At least nine works cited in the text, among them the four critical studies it names, are missing from the 13-item reference list, and one citation bracket is empty [1 pp. 9–11]. The source of the earthquake catalogue is rendered "Seismopathogenic Monitoring" [1 p. 10]. The QuakeFinder project is said to have found pulses increasing "starting two years" before earthquakes, where the study cited reports increases in the 30 days before three events [1 p. 9][11]. None of this changes the paper's finding; it does say something about how closely the paper was checked before publication.

6 · THE WIDER EVIDENCE

No magnetic precursor has yet passed an independent test

The international commission convened after the 2009 L'Aquila earthquake reviewed the main proposed precursors and concluded: "The search for diagnostic precursors has thus far been unsuccessful" [19 p. 338]. Magnetic signals are no exception, and the paper's own finding, a high background of anomalies without earthquakes, is part of the reason.

Loma Prieta and Guam, the classic cases

Ultra-low-frequency magnetic noise recorded 7 km from the 1989 Loma Prieta epicentre, rising days before and sharply three hours before the earthquake, "may have been magnetic precursors" [14], and a changed polarisation ratio about a month before the 1993 Guam earthquake was judged "very likely" precursory [17]. Re-analyses found the Loma Prieta signal "widespread throughout the western United States" and so a coincidental solar-terrestrial disturbance [15] or an instrument problem [16], and the Guam changes "part of normal global magnetic activity … unrelated to the earthquake" [18]. The commission's summary: these "most convincing" precursors "were likely to have been caused by solar-terrestrial interaction or sensor-system malfunction" [19 p. 335].

Parkfield, the instrumented fault

The best-monitored test came with the magnitude 6.0 Parkfield earthquake of September 2004, inside an array of seven proton magnetometers that had waited for it since 1976. The array's operators reported co-seismic changes of 0.2–0.5 nT at five sites and "No preseismic magnetic field changes exceeding background noise levels are apparent in the magnetic data during the month, week, and days before the earthquake" [29]. Electric and magnetic fields in the 0.0001–1 Hz band at two sites, analysed over 875 days around the event with several statistical methods, showed "high levels of sensitivity to subtle electromagnetic effects", but "no effects were found that can be reasonably characterized as precursors" [10]. The paper reports this result correctly [1 p. 9].

The statistical cases, and their critics

The strongest claims now come from Japan, where ten years of night-time data at Kakioka gave a probability gain of about 1.6 over a random model for anomalies 6–15 days before sizeable earthquakes [8], and a Kanto network gave predictions "significantly better than random guesses" [21]. Masci and Thomas reply that "a causal relationship between preearthquake magnetic changes and impending earthquakes has never been demonstrated" and see no significant evidence in the new work [9]; Masci had earlier shown that a set of reviewed ULF "precursors" were "actually caused by normal geomagnetic activity" [20]. A 1993 review of the field already noted that the community was "no closer to understanding why precursors are observed only in some cases" [28].

QuakeFinder, tested by its own data

The Californian network the paper describes reported pulse activity rising in the 30 days before three earthquakes [11], then a 2019 analysis of more than 100 stations that reported a 2.2-sigma effect and "some suggestion of predictive power", with a corrigendum in 2022 [13]. The project's own pre-specified case-control test of a decade of data, 19 earthquakes of magnitude 4.5 and above, found "a modest effect in the days leading up to an earthquake" whose size "is not directly useful for earthquake prediction" [12].

Why a background of unexplained anomalies matters

The commission's finding on precursors in general: there is "a bias towards publishing positive rather than negative results, so that the rate of false negatives (earthquake but no precursory signal) cannot be ascertained", and "Because the signal behavior in the absence of earthquakes is often not characterized, the rate of false positives (signal but no earthquake) is unknown. Without constraints on these error rates, the diagnostic properties of the signal cannot be evaluated" [19 p. 361]. The Uzbek paper documents exactly that background: dozens of signals, none tied to an earthquake [1 pp. 4, 9]. As a description of the noise, it is a necessary first step; as evidence of precursors, it points the other way.

The "atmospheric electricity" side

What the tests found

The commission found that seismo-ionospheric signals, averaged over many events, are small against the noise and that "the conditional statistics of retrospective precursor detection are too weak to provide any probability gain in earthquake forecasting" [19 p. 335]. A later test compared the ionosphere's total electron content with 1,279 earthquakes of magnitude 6.0 and above in 2000–2014 and "found no evidence that would suggest that monitoring changes in GIM-TEC might be useful for predicting earthquakes" [23]. A widely cited claim that the electron content rises 40 minutes before great earthquakes proved to be "an artifact induced by the definition of the reference line" [24].

OUR ANALYSIS

Many reports, no validated precursor

The presenter is right that the ionospheric and atmospheric-electricity literature is larger than the geomagnetic one: a 2021 ground-based review lists cases for both and the physical models proposed for them [25]. Larger is not the same as better documented. The companion review of satellite observations concludes that "the statistical significance of the results are highly debated, and more in general a common consensus is still missing" [26]. The episode's third paper, which builds a forecasting model on such data, is checked on its own page.

The standard a precursor claim has to meet

Our out-of-sample test of a solar-timing claim set out what a fair test of a prediction claim needs: “Freeze the rules, data versions and code before scoring any event, and publish them”; “Test hit rates against the share of time the windows cover, using a null model that keeps earthquakes clustered”; and “Hold back part of the record, or wait for new events, before claiming significance.” Nothing this paper cites in favour of magnetic precursors has passed all three, and the paper itself makes no prediction to test. The ICEF asks the same of any precursor: known rates of hits, misses and false alarms `[19 p. 361]`.

7 · BOTTOM LINE

Background noise, carefully recorded, and mistaken for a signal

The authors conclude

The cause of these anomalies cannot be settled from the Uzbek test sites alone; their variety makes precursor anomalies harder to pick out; long-term monitoring with several geological and geophysical methods is needed, and an anomaly should count as a precursor only when two or more methods show it at once and its extreme coincides with the main shock `[1 pp. 9–10]`.

OUR ANALYSIS

Our conclusion

A modest, honest conference paper about noise: fifty years of surveys show magnetic changes of 3–50 nT that the authors cannot tie to earthquakes and do not try to `[1 pp. 4, 7–9]`. The episode turned it into evidence of “the ways the Earth snitches on itself before big quakes” `[2 00:01:57]`. The paper’s weaknesses, a comparison made by eye, a shared drift it does not explain and a misread source, cut against precursors too, not for them.

Limits of this check

Abstracts for most of the literature

We read the paper, the ICEF report and the Conti review in full; for the other studies we read abstracts or records, and two are cited from their records alone `[16]` `[22]`. Han et al. (2014) is paywalled, so the paper’s “approximately 20%” figure is unchecked `[8]`.

The companion paper and the observatory

The authors’ 2025 journal paper was read as an abstract only `[7]`, and the observatory’s record came from a search engine’s copy of a page that was offline `[27]`.

Values read by eye

The chart’s numbers were read from the paper’s Figure 6, whose year axis is mislabelled; they are good to about 1 nT and about a third in energy, and the energies were not checked against the catalogue the paper cites `[1 Fig. 6]`.

What would change this verdict

01
A per-event test by the authors, matching individual anomalies to individual earthquakes against a null model that keeps earthquakes clustered, with a reported rate of hits and false alarms. A significant result would move the “no link” claim and the episode’s framing towards True.

02
Evidence that the shared drift and the point-by-point steps are not instrumental or observatory effects: simultaneous readings against a second reference observatory, or the observatory’s own baseline record over 2004–2025. That would firm up “real, repeatable”.

03
For magnetic precursors in general, a prospective test with frozen rules and published hit and false-alarm rates that beats chance; none of the studies cited here has provided one.

A correction from the authors on their account of Han et al. (2014) would change nothing about the anomalies, but would change our verdict on that sentence.

Prepared by Fact-Checked Science from the open-access text and figures of Makhsudov et al. (2026), *E3S Web of Conferences* 745, 01007, doi:10.1051/e3sconf/202674501007, CC BY 4.0 `[1]`. The chart is redrawn from the paper’s Figure 6 with values read by eye. The assessment is our own and has not been reviewed by the authors.

Related checks

FALSE Olivine and earthquakes The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For the paper [1], p. and pp. are pages of its 11-page PDF and Fig. one of its six figures. For the ICEF report [19], p. is the journal’s page number (315–391). Times such as 00:02:06 are positions in the episode’s video [2]. Links checked October 22, 2026.

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2 SpaceWeatherNews (S0) (October 22, 2026). Magnetic Pole Shift & The Largest Extinction Ever | S0 News Oct.22.2026. YouTube video. Quoted from the automatically generated transcript; times are positions in the video.

3 EDP Sciences (2026). E3S Web of Conferences, Volume 745 (2026): School of Young Seismologists (YSS 2026), Tashkent, Uzbekistan, August 24–28, 2026, F. Boltaev (Ed.). Table of contents, 50 papers in eight sections. Accessed October 22, 2026.

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12 Heavlin, W. D., Kappler, K., Yang, L., Fan, M., Hickey, J., Lemon, J., MacLean, L., Bleier, T., Riley, P., and Schneider, D. (2022). Case-control study on a decade of ground-based magnetometers in California reveals modest signal 24–72 hr prior to earthquakes. *Journal of Geophysical Research: Solid Earth* 127(10), e2022JB024109. CC BY-NC-ND 4.0. Abstract only.

13 Kappler, K. N., Schneider, D. D., MacLean, L. S., Bleier, T. E., and Lemon, J. J. (2019). An algorithmic framework for investigating the temporal relationship of magnetic field pulses and earthquakes applied to California. *Computers & Geosciences* 133, 104317; with a corrigendum, 159, 105014 (2022). Abstract only.

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METHOD

How this was checked

On October 22, 2026, we checked every statement, number, quotation and citation on this page against its source: the paper’s full text and its six figures, read from the images embedded in its PDF; the proceedings volume’s contents page and its Statement of Peer review; E3S’s publishing policy; the episode’s transcript; the ICEF report and the Conti review in full; and the abstracts or records of the other 22 sources, about 95 items in all. The chart’s values were read from the paper’s Figure 6 by eye and are good to about 1 nT and, for the energies, about a third. A fresh reviewer who had not seen the drafting then read the built page against fresh copies of the sources, resolved every DOI again and regenerated the chart from our script; every quotation, number and DOI held. The changes that followed: the volume has 50 papers, not 52; the QuakeFinder study of 2019 is now described from its abstract, a 2.20 z-score and “some suggestion of predictive power”; the Parkfield array’s own report is quoted; “all 22 points” became “nearly all”; and a dozen smaller corrections of wording and locators.

The verdicts and the items tagged “Our analysis” are our own assessment, built on the cited sources. They include our reading of which of the episode’s sentences belong to which of the three papers it covered, the point that the paper’s comparison with seismicity is made by eye, the coherent drift of the zone-1 average and what else could produce it, the count of in-text citations without a reference entry, and the comparison of the paper’s account of Han et al. (2014) with that paper’s abstract.

Nothing was recomputed, because the paper publishes no data and no statistics; its “no correlation” rests on a figure. We could not read Han et al. (2014) in full, so the paper’s “approximately 20%” figure is unchecked. The authors’ 2025 journal paper was read as an abstract only, its journal’s site being unreachable, and the seismic-energy values behind Figure 6 were not checked against the catalogue the paper cites.

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.
`MISREAD`	Cites a real source but gets wrong what it says.
`UNCONFIRMED`	Rests on a preliminary result that hasn’t been confirmed.
`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

Oct 22, 2026	Published on factchecked.science after a full check against the sources. Built from our verification report on the paper, the proceedings’ pages, the episode’s transcript and the literature listed here. The six verdicts and their short labels follow the labels shared with the episode’s other two pre-quake pages; the label for the “atmospheric electricity” claim changed from the report’s “Atmospheric signals well shown” to “Atmospheric signals documented” for that reason, with the same verdict.

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

Last updated Oct 22, 2026