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PAPER CHECK · ASTRONOMY

A new name for four slow novae, and a 1.437-day orbit we can't find in TESS data

Mariko Kato and Izumi Hachisu group four slow novae, name them "metamorphic", model the rise of the newest, Gaia22alz, and dispute how Aydi et al. read its early spectra [1 Abstract][3 p. 1946]. It's an accepted manuscript by the authors' statement, with a referee thanked and no journal record yet, and nothing in it touches Earth, the Sun or a magnetic field. The name is new, but the novae, their light-curve class and the theory aren't. And in our own analysis, not reviewed by others, the TESS signal nearest the paper's 1.437-day orbit belongs to a neighbouring eclipsing binary, though we can't say what the authors ran.

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OUR ANALYSIS marks our own reasoning and calculations, including all of the TESS work, which no one outside this site has reviewed, and the verdicts are our assessment. Everything else comes from the numbered sources. We read the paper [1] in full, as an arXiv manuscript; for it §, Fig. and Table give a section, figure or table, and p. a page of that PDF. For the published Aydi et al. and Hillman et al. [3][5], p. gives the journal's page.

A new name for known novae, a good fit with a chosen time scale, and an orbit we could not confirm

OUR ASSESSMENT

44.5″

from the nova sits a known eclipsing binary whose 5.6946-day period, divided by four, is 1.4237 days. That is the TESS signal nearest the paper's 1.437 days, 0.9% away [1 §6.2][26]. Our analysis, not reviewed by others

1.4 mag

still to climb when the model flattens, near day 105, on the way to the first peak on day 177, on the paper's own plot [1 Fig. 5]. Our analysis

84–94%

of novae with reliable periods are at 3 days or less, depending on which periods are counted, so four of four being close binaries shows little [9 Table 6]. Our analysis

THE PAPER'S CLAIMS

OVERSTATED

"consistently explains the slow rise and early spectral evolution"

The paper's abstract [1 Abstract]

On the paper's plot the model tracks the V band to about 0.2 mag from day 29 to day 106 [1 Fig. 5]. But a chosen factor sets the rise's length, and the time origin and distance are fitted [1 §3.2][1 §6.1]. The model flattens 1.4 mag below the first peak, computes no companion and no transition [1 §7], and doesn't test He II's measured strength [3 p. 1948]. It's a good fit, not yet an explanation. Our analysis; see section 3.

UNCONFIRMED

"Our results do not support E. Aydi et al.'s explanation"; "We found no indication of X-ray/UV irradiations"

The paper's abstract and conclusions [1 Abstract][1 §7]

A model that doesn't need irradiation doesn't show there was none. The paper's number is 0.3–1 keV X-rays from its own photosphere [1 §5.2], while Aydi et al. propose mostly far-UV light, with X-rays relatively weak, for the first 50 days [3 p. 1953]. They had no X-ray or UV data for the rise, and neither paper has any [3 p. 1953]. Neither reading is confirmed. See section 7.

UNSUPPORTED

"1.437 day orbital period"

The paper's conclusions [1 §7]

The paper names a web tool and gives no sector, aperture or uncertainty [1 §6.2]. The nearest signal we find in TESS belongs to a neighbouring eclipsing binary, 44.5″ away [23][26]. We can't say what the authors ran, and a weak real signal isn't excluded. A 6.4-hour signal sits on the nova's own pixel, before the outburst and after it. It's a candidate from one instrument, though the reading leans towards an orbit. Our analysis, not reviewed by others; see sections 4 and 5.

OVERSTATED

"This supports our metamorphic nova hypothesis"

The paper's conclusions [1 §7]

"Consistent", the abstract's word, is fair [1 Abstract]; "supports" asks more. Of 156 novae with reliable periods, 84% are at 3 days or less [9 Table 6]. Four picked at random would all be that close 49–79% of the time, and having a short period is one of the group's requirements [1 §2.6]. Our analysis; see section 6.

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1 · THE PAPER, AND WHAT WE READ

An accepted manuscript about binary stars, with nothing in it on Earth, the Sun or a magnetic field

Here's what Mariko Kato and Izumi Hachisu's paper is, and what this check rests on.

Its status, exactly

An accepted manuscript, by the authors' statement. arXiv's comment says "accepted for publication in ApJ", and the paper thanks an anonymous referee [1 p. 15]. On November 4, 2026, arXiv shows no journal reference or journal DOI, and a title search at Crossref finds no journal record, so there's no journal version to compare [1]. It reached arXiv at 18:10 UT on November 3 [1], and S0 News linked it on November 4 [2].

What we read

The paper in full, with its source files and vector figures [1]. Aydi et al. (2023) and Hillman et al. (2014) in full, from PDFs the site's owner downloaded, because their publisher shows our tools a bot check [3][5], and the spectra Aydi et al. posted [3 p. 1957].

What the paper does

It reports no new observations. It groups four slow novae by published light curves and spectra, runs five models of the rise using spherical static envelopes, and joins them to earlier wind models for the decline [1 §3.2][1 §4.5]. For Gaia22alz's orbit it reports one period, from a web tool [1 §6.2]. It also argues against Aydi et al.'s reading of the star's early spectra [1 §5]. It states no funding [1 p. 15].

Nothing here touches Earth, the Sun or a magnetic field

A nova is a thermonuclear eruption on a white dwarf that is accreting gas in a binary [1 §1]. We searched the paper's text. Geomagnetic, pole, reversal, excursion, secular, dipole, magnetic, micronova and Sun don't occur; "solar" is a chemical composition, four times, and "Earth" is a university department, once [1]. Nothing in it bears on the solar micronova idea checked in The Disaster Cycle, Fact-Checked.

2 · A PROPOSED CLASS

A new name and a proposed class, for novae already known and already compared

The authors say they dub the group "for convenience" [1 §1] and place it "among other classes of novae" [1 Fig. 2]. What's new in 2026 is the name and a class defined by its mechanism, plus one member.

How old each part is

YEAR	WHAT HAPPENED	SOURCE
1967, 1995, 2007	HR Del, V723 Cas and V5558 Sgr erupt	[1 Table 1]
2009	Kato and Hachisu suggest a nova could start with no strong wind and then switch to one, with oscillations	[7], as told in [6 §4.1]
2010	Strope, Schaefer and Henden define light-curve class J, for jitters: 14 of the 85 novae in their unbiased sample, 16%, in a catalogue of 93. They name V723 Cas and HR Del in a possible subclass with jitters only near the peak	[8 Abstract]; [8]
2011	Kato and Hachisu propose that the companion triggers the switch, naming the same three novae; they call V723 Cas's model a "transition nova"	[6 Abstract]; [6 Fig. 5]
2022	Gaia22alz, also Nova Velorum 2022, erupts	[3 p. 1946]
2023	Aydi et al. call Gaia22alz's absolute magnitude and light-curve shape comparable to those of slowly evolving novae, naming HR Del, V5558 Sgr and "V732 Cas", which we read as V723 Cas	[3 p. 1948]
2026	Kato and Hachisu add Gaia22alz and name the group: "We name these novae metamorphic novae"	[1 §7]

OUR ANALYSIS

What the proposal adds

A class defined by a physical mechanism, where Strope et al.'s classes rest on the light curve's shape [1 §6.3]. That part is new. But the objects and their grouping aren't, and the mechanism is a hypothesis in the paper's own word [1 §6.3]. So what the paper offers is a new name and a proposed class. Whether others will use the name can't be known yet; the paper is days old.

Has the idea been taken up?

As one possibility. OpenAlex lists 29 works citing the 2011 paper, 21 with neither author on them [22]. We read how five of those 21 use it. Chomiuk et al.'s review lists it among mechanisms that could produce flares, and notes that it may matter in the slowest novae [13 §2.2.3][13 §2.3.1]. Steinberg and Metzger say truly predictive models must handle the Roche lobe in several dimensions [18]. Das et al. and Metzger et al. describe or cite it in passing [19][20]. Shen and Quataert criticise its approach (section 3) [12 §4]. The word "metamorphic" doesn't appear in the 2011 paper [6], and arXiv's abstract search finds it only in this one [1].

OUR ANALYSIS

How far would the group reach?

The paper says it's unclear whether all J-class novae belong [1 §6.3]. Schaefer's catalogue suggests many wouldn't: 23 of its 40 J novae with masses are above 0.70 M☉, the range is 0.53–1.24 M☉ [10 Table 1], and only 5 of Strope et al.'s 14 are at 0.70 M☉ or below. The group requires about 0.6 M☉ [1 §2.6]. That catalogue draws on 89 model masses from these authors' own papers [10 §2], and its J-class mean is 0.77 M☉ [10 Table 2].

OUR ANALYSIS

Cases the scheme will need to explain

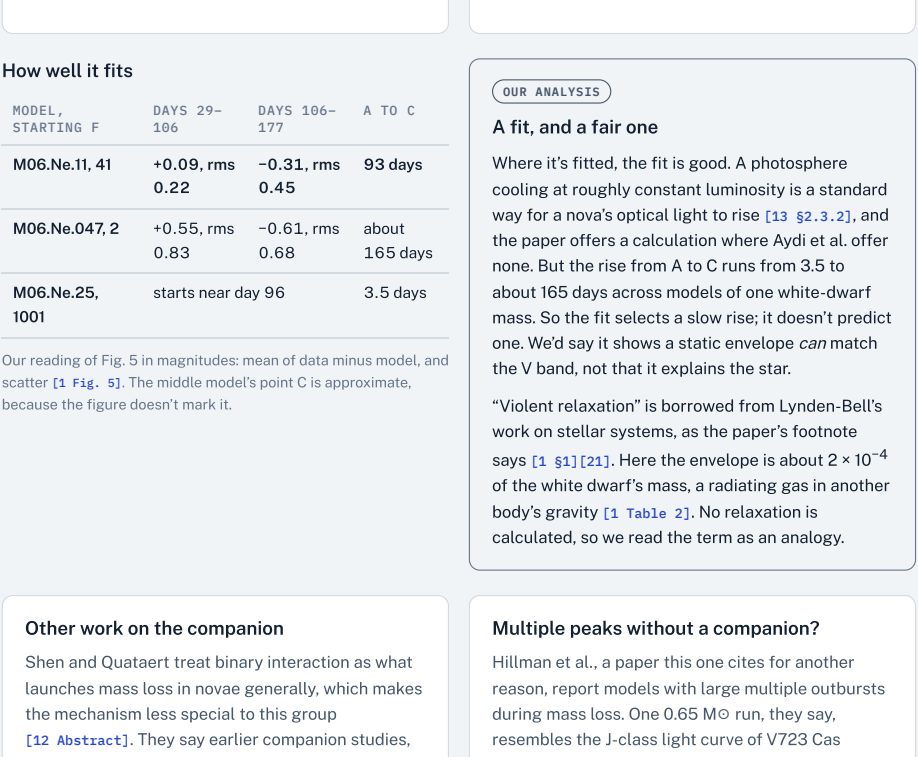
The paper ties long flat peaks to wide binaries [1 §2.1][1 Fig. 2], but Schaefer lists flat-topped F-class novae in close binaries: DO Aql at 0.168 d and 0.41 M☉, V849 Oph at 0.173 d and 0.55 M☉, and BT Mon at 0.334 d. Schaefer also lists very slow, smooth novae in close binaries: V365 Car at 0.224 d and 0.51 M☉, and X Ser at 1.478 d, which the 2022 table calls S(730) and the 2025 table F(730) [10 Table 1][9 Table 6]. Strope et al.'s F is a light-curve shape and may not be the paper's "flat peak", so these are questions and not refutations.

3 · WHAT THE MODEL DOES

The model follows the rise to about day 105, with a chosen time scale, and doesn't follow what comes next

The authors are candid about its reach: their codes "cannot directly follow" the structure change, so the models treat mainly the rising phase [1 §7].

Gaia22alz's rise and three of the paper's models



Adapted from Fig. 5 of [1], CC BY 4.0: the points and curves as the paper plotted them, read from the vector file in its arXiv source, with its shift of ASAS-SN g to match AAVSO V [1 Fig. 5]. Days count from Aydi et al.'s start date [3 p. 1947]. We show the rise only, three of five models, without upper limits. A, B and C are the model's points at log T = 5.0, 4.48 and 4.0 [1 §4]. ASAS-SN and AAVSO observers made the measurements, with thanks.

What it doesn't follow

- **The last 1.4 mag of the rise.** The model flattens near 12.2 mag from about day 105; the nova reaches 10.78 on day 177 [1 Fig. 5]. Our reading of the figure.
- **The multi-peak phase.** Spherical static and steady-state codes can't follow it, the paper says [1 §4.4].
- **The transition.** Figure 6 joins the static and wind curves with a guide line, and takes half the envelope to be lost in between [1 Fig. 6].
- **The companion.** "We do not include the effects of binary motion" [1 §3.2]. The trigger comes from the 2011 paper's one-dimensional approximation, in which the static envelope's structure comes close to the wind solution [6 Abstract].

Left to itself, the fitted model would stay at the plateau for about 600 years [1 §4.2]; the transition is what brings it down.

What's chosen or assumed

- **The rise's length.** Each step's duration comes from an inflow factor f, set "to mimic" the energy flow: 1001, 41 and 2 at the start of the three 0.6 M☉ models, then declining by a form the paper doesn't give [1 §3.2].
- **The time origin.** Each model is shifted sideways to line up at point C [1 §4].
- **The distance.** Fitted to the plateau "by eye" [1 §6.1], so Gaia22alz's M_V ~ −5.5, part of the group's definition, is partly built in. Gaia's parallax, 0.056 ± 0.122 mas, can't test it; the distances it yields, 6.2–6.5 kpc with wide ranges, lean on priors, against the paper's 8.15 kpc [24][25].
- **The composition.** "We do not know" it, and a neon-nova mix is assumed [1 §3.2].
- **The white dwarf's mass.** About 0.6 M☉ for Gaia22alz comes from this fit [1 §2.2], and it's also a requirement of the group [1 §2.6]. The paper compares only 0.55 and 0.6 M☉, and finds their light curves close [1 §4].

How well it fits

MODEL, STARTING F	DAYS 29–106	DAYS 106–177	A TO C
M06.Ne.11, 41	+0.09, rms 0.22	−0.31, rms 0.45	93 days
M06.Ne.047, 2	+0.55, rms 0.83	−0.61, rms 0.68	about 165 days
M06.Ne.25, 1001	starts near day 96		3.5 days

Our reading of Fig. 5 in magnitudes: mean of data minus model, and scatter [1 Fig. 5]. The middle model's point C is approximate, because the figure doesn't mark it.

OUR ANALYSIS

A fit, and a fair one

Where it's fitted, the fit is good. A photosphere cooling at roughly constant luminosity is a standard way for a nova's optical light to rise [13 §2.3.2], and the paper offers a calculation where Aydi et al. offer none. But the rise from A to C runs from 3.5 to about 165 days across models of one white-dwarf mass. So the fit selects a slow rise; it doesn't predict one. We'd say it shows a static envelope *can* match the V band, not that it explains the star.

"Violent relaxation" is borrowed from Lynden-Bell's work on stellar systems, as the paper's footnote says [1 §1][21]. Here the envelope is about 2 × 10^{-4} of the white dwarf's mass, a radiating gas in another body's gravity [1 Table 2]. No relaxation is calculated, so we read the term as an analogy.

Other work on the companion

Shen and Quataert treat binary interaction as what launches mass loss in novae generally, which makes the mechanism less special to this group [12 Abstract]. They say earlier computations, Kato and Hachisu (2011) among them, used one-dimensional spherical steady envelopes [12 §4]. They also find that isolated white dwarfs below about 0.8 M☉ don't develop unbound thick winds at any stage, while Kato and Hachisu (2009) get winds down to 0.5 M☉ [12 §4]. That bears on the 0.6 M☉ solar-composition wind in Figure 6 [1 Fig. 6]. The paper lists their article among its references, and doesn't discuss it [1].

Multiple peaks without a companion?

Hillman et al., a paper this one cites for another reason, report models with multiple outbursts during mass loss. One 0.65 M☉ run, they say, resembles the J-class light curve of V723 Cas [5 p. 1973]; the code's description includes no companion [5 p. 1964]. Chomiuk et al. mention this route, envelope contraction and re-expansion, and note that other work hasn't found it [13 §2.3.1]. So the mechanism for the multiple peaks is an open question, as the review says more broadly [13].

4 · THE 1.437-DAY PERIOD

The nearest TESS signal we find belongs to a neighbouring star

OUR ANALYSIS Everything in this section beyond the paper's own sentence is our analysis of public data. A separate review within this site caught errors in an earlier draft, which the change log lists; no one outside this site has reviewed it. The paper names no sector, aperture or uncertainty, so we can't say what its authors ran.

What the paper says

All of it is one sentence: "We have determined the orbital period of Gaia22alz to be" 1.437 day, "using TESSExtractor" [1 §6.2]. There's no sector, aperture, amplitude, uncertainty, periodogram or folded curve. Sections 2.1, 3.2, 4.3 and 6.2 build on it [1]. VSX lists no period for the star [26].

What the tool's authors advise

TESSExtractor is a public web tool, described in a paper submitted to a journal. Its authors warn that TESS data, with 21″ pixels, are "highly susceptible to crowding", and advise caution above 15% on their contamination metric [11 §2.2]. It searches 500 trial periods spaced about 1.6% apart [11 §2.8.1]. It offers pixel-by-pixel curves to tell a target's variability from a neighbour's [11 §2.5]. It needs a browser, so we didn't run the tool itself. We re-implemented its stated search, on flux rather than magnitudes, with no aperture correction and no cotrending, since its default "extracts the LC without applying instrumental corrections" [11 §2].

CONTAMINATION, 1.5 PIXELS

OUR ANALYSIS

91%

for Gaia22alz in quiescence, G = 18.385, from Gaia DR3, with 36 other stars in the tool's default aperture [24][11 Table 1]. The metric counts only stars inside the aperture, so it doesn't count this neighbour at all [11 §2.2]

THE NOVA'S WHOLE FLUX

OUR ANALYSIS

11 e^-/s

in TESS before the outburst, from Gaia's magnitudes [24][27]. With a plain median sky, the neighbour's eclipses take 21–31 e^-/s out of its aperture in sectors 9, 10 and 37, more than that whole flux, so they can't be the nova's. The 1.42-day semi-amplitude there is only 3–6 e^-/s. The tool's sky recipe reads 61–85 and 10–13 e^-/s, inflated because that sky rises during an eclipse [23]

LEFT AT 1.437 DAYS

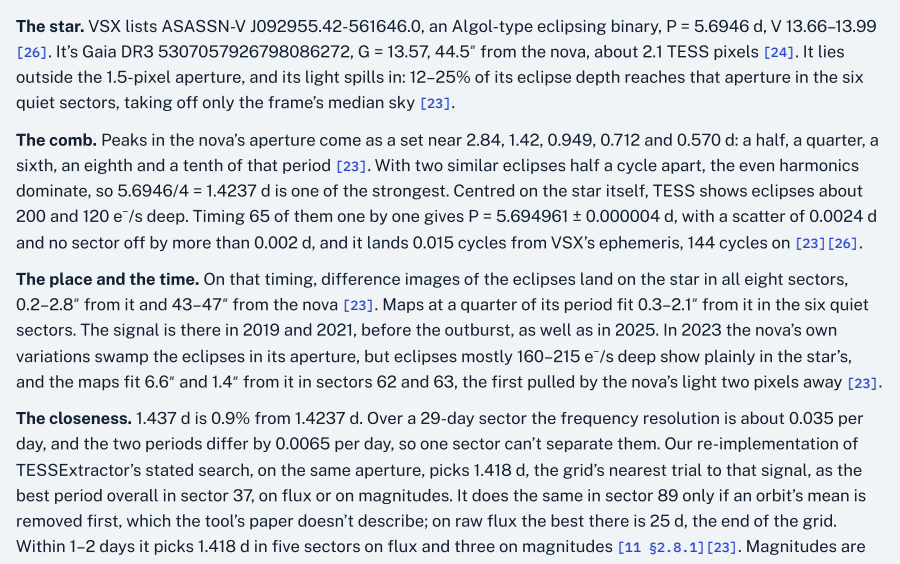
OUR ANALYSIS

0.3 e^-/s

in sector 89, S/N 0.9, with a median sky, after subtracting the neighbour's folded curve with one scale factor, down from 5.6 e^-/s peak beside it. S/N stays at about 2 or under in every sector, with either sky, on a test that keeps 90–95% of an injected signal [23]

What's in the nova's aperture, TESS sector 89 (2025)

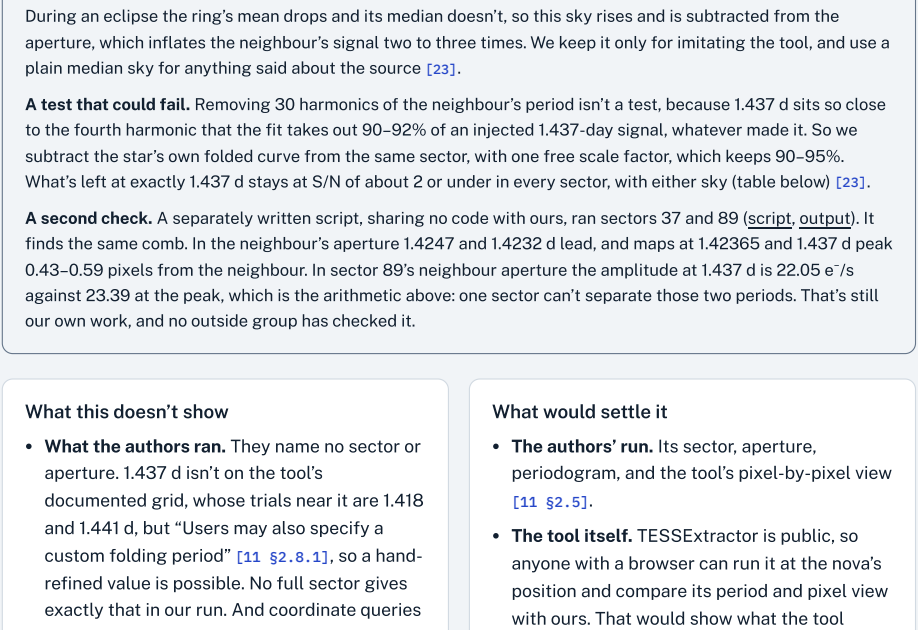
OUR ANALYSIS



Our analysis of public TESS full-frame images, through MAST's TESScut [23]: a 1.5-pixel aperture on the nova, as the tool's default [11 Table 1], with a plain median sky; the tool's sky recipe makes those peaks about three times taller. Light curves binned to 30 minutes and high-passed with a 4-day running median. Not from the paper.

Where each signal comes from, TESS sector 89

OUR ANALYSIS



Our analysis of public TESS full-frame images [23]. The positions come from Gaia DR3 [24] through the cutout's coordinates. The diamond is the eclipsing binary from VSX [26]. Other patches near the maps' edges come from other field stars, which we didn't study. The right-hand map has the neighbour's harmonic removed, which leaves a signal at that period in place. Squares below about 8% of the peak are left blank. Hover over a shaded square for its amplitude.

OUR ANALYSIS

What ties the 1.42-day signal to the neighbour

The star. VSX lists ASASSN-V J092955.42-561646.0, an Algol-type eclipsing binary, P = 5.6946 d, V 13.66–13.99 [26]. It's Gaia DR3 5307057926798086272, G = 13.57, 44.5″ from the nova, about 2.1 TESS pixels [24]. It lies outside the 1.5-pixel aperture, and its light spills in: 12–25% of its eclipse depth reaches that aperture in the six quiet sectors, taking off only the frame's median sky [23].

The comb. Peaks in the nova's aperture come as a set near 2.84, 1.42, 0.949, 0.712 and 0.570 d: a half, a quarter, a sixth, an eighth and a tenth of that period [23]. With two similar eclipses half a cycle apart, the even harmonics dominate, so 5.6946/4 = 1.4237 d is one of the strongest. Centred on the star itself, TESS shows eclipses about 200 and 120 e^-/s deep. Timing 65 of them one by one gives P = 5.694961 ± 0.000004 d, with a scatter of 0.0024 d and no sector off by more than 0.002 d, and it lands 0.015 cycles from VSX's ephemeris, 144 cycles on [23][26].

The place and the time. On that timing, difference images of the eclipses land on the star in all eight sectors, 0.2–2.8″ from it and 43–47″ from the nova [23]. Maps at a quarter of its period fit 0.3–2.1″ from it in the six quiet sectors. The signal is there in 2019 and 2021, before the outburst, as well as in 2025. In 2023 the nova's own variations swamp the eclipses in its sectors, but eclipses mostly 160–215 e^-/s deep show plainly in the star's, and the maps fit 6.6″ and 1.4″ from it in sectors 62 and 63, the first pulled by the nova's light two pixels away [23].

The closeness. 1.437 d is 0.9% from 1.4237 d. Over a 29-day sector the frequency resolution is about 0.035 per day, and the two periods differ by 0.0065 per day, so one sector can't separate them. Our re-implementation of TESSExtractor's stated search, on the same aperture, picks 1.418 d, the grid's nearest trial to the quarter, as the best period overall in sector 37, on flux and on magnitudes. It does the same in sector 89 only if an orbit's mean is removed first, which the tool's paper doesn't describe; on raw flux the best there is 25 d, the end of the grid. Within 1–2 days it picks 1.418 d in five sectors on flux and three on magnitudes [11 §2.8.1][23]. Magnitudes are awkward here: with this sky recipe the aperture flux is at or below zero in 75% of sector 10's cadences and 9% of sector 90's [23].

Two skies. To imitate the tool we use its sky recipe, 3 × median − 2 × mean of a ring of pixels around the aperture. During an eclipse the ring's mean drops and its median doesn't, so this sky rises and is subtracted from the aperture, which inflates the neighbour's signal two to three times. We keep it only for imitating the tool, and use a plain median sky for anything said about the source [23].

A test that could fail. Removing 30 harmonics of the neighbour's period isn't a test, because 1.437 d sits so close to the fourth harmonic that the fit takes out 90–92% of an injected 1.437-day signal, whatever made it. So we subtract the star's own folded curve from the same sector, with one free scale factor, which keeps 90–95%. What's left at exactly 1.437 d stays at S/N of about 2 or under in every sector, with either sky (table below) [23].

A second check. A separately written script, sharing no code with ours, ran sectors 37 and 89 (script, output). It finds the same comb. In the neighbour's aperture 1.4247 and 1.4232 d lead, and maps at 1.42365 and 1.437 d peak 0.43–0.59 pixels from the neighbour. In sector 89's neighbour aperture the amplitude at 1.437 d is 22.05 e^-/s against 23.39 at the peak, which is the arithmetic above: one sector can't separate those two periods. That's still our own work, and no outside group has checked it.

What this doesn't show

- **What the authors ran.** They name no sector or aperture. 1.437 d isn't on the tool's documented grid, whose trials near it are 1.418 and 1.441 d, but "Users may also specify a custom folding period" [11 §2.8.1], so a hand-refined value is possible. No full sector gives exactly that in our run. And coordinate queries "can sometimes resolve to neighbouring TIC objects in crowded regions" [11 §4.1.6], which we can't check for their run.
- **That the nova has no period near 1.437 days.** A weak real signal isn't excluded. Through the one-scale removal, with a median sky, we'd recover a sinusoid at 1.437 d only above about 3–4 e^-/s in a 1.5-pixel aperture in 2019, 2021 and 2025, or 0.75–1.5 e^-/s in a 1-pixel one, and above 50 and 30 e^-/s in 2023, a few per cent of the nova's flux then [23].
- **That Gaia22alz isn't a close binary.** It very likely is; see section 5.

What would settle it

- **The authors' run.** Its sector, aperture, periodogram, and the tool's pixel-by-pixel view [11 §2.5].
- **The tool itself.** TESSExtractor is public, so anyone with a browser can run it at the nova's position and compare its period and pixel view with ours. That would show what the tool returns, though not which run the authors chose.
- **Radial velocities.** Time-resolved spectra of the system now that it has faded would measure the orbit directly.
- **Independent photometry.** Ground-based images resolve a neighbour 44.5″ away with ease, so a period seen there couldn't be this star's. OGLE monitored the progenitor from 2017 to 2020 [3 p. 1951]. Gaia DR3 counts 457 G-band observations of the star [24], and those epochs, if released, would be clean of this neighbour too.

5 · A 6.4-HOUR CANDIDATE

On the nova's own pixel there's a different signal, before the outburst and after it: a candidate, leaning towards the orbit

OUR ANALYSIS We didn't look for this in advance. Once the neighbour's harmonics were removed it stood out in 2023 and 2025, and we then wrote checks to try to break it. An earlier draft of this page called it absent before the outburst. That was a false negative from a noisy sky estimate: with a cleaner one it's there. It stays a candidate from one instrument.

The 0.268-day signal, against what would break it

CHECK	RESULT
On the nova?	Yes. In-phase maps fit 1.0″, 1.0″, 2.0″ and 0.7″ from Gaia22alz in sectors 62, 63, 89 and 90, with star-like widths [23][24]. The nearest star as bright as the nova in quiescence is 12.7″ away; a G = 20.85 star is at 4.6″.
Before the outburst?	**Present, weakly.** At the period fixed from 2025, 0.34 and 0.42 e^-/s in 2019 and 2021, in a 1.5-pixel aperture with a plain median sky: 3–4% of the star's 11 e^-/s. In a 1-pixel aperture, 0.26 and 0.24 e^-/s stand above all 306 nearby control frequencies, whose medians are 0.06 and 0.07, and none of 2,000 one-day-block shuffles reaches them. The nova's pixel ranks 1st of 225 in sectors 9, 10 and 37 and 2nd in 36, beside the 1st. In-phase maps fit 2.3″, 5.3″, 2.1″ and 2.6″ from the nova in 9, 10, 36 and 37. A high-pass of 0.5 to 4 days changes nothing, and eight 1-pixel apertures 5 pixels off stay within their controls. Over the whole 0.05–10 per day grid the false-alarm probability is 0.025 and 0.17, and 0.2676 d is the top peak in 2019. The tool's noisier sky hides it: 0.40 and 0.70 e^-/s, inside its controls [23]
Tracks the nova?	Yes. About 0.35–0.4 e^-/s before the outburst, 25.7 in sector 62, 11.2 in 63, then 3.0 in 89 and 90, in a 1.5-pixel aperture with a median sky; about 1.0% and 1.5% of the nova's rough flux in 62 and 63 [23]. A field star can't do that
Chance?	Unlikely. In 2023 and 2025 it's the highest peak from 0.1 to 20 d after a 1-day high-pass, false-alarm probability under 0.001, though sector 63 alone is weaker, 0.08 [23]
Elsewhere in the cutout?	The pixel maps are quiet away from the nova. Some apertures 5 pixels off show 1–10 e^-/s in sectors 62 and 89 with the tool's sky; we put that down to the nova's light in their sky annuli, as an inference [23]
Shape	Not quite sinusoidal: a harmonic at P/2 of about 15% in 2025, 0.34 e^-/s against local noise of 0.04 in a 1-pixel aperture, and nothing at 2P, 0.12 against 0.09. Odd and even minima match within their errors [23]
Stable across years?	**In the quiet years, yes; 2023 drifts.** 2019, 2021 and 2025 agree within their errors: 0.26751 d (68% range 0.26737–0.26768), 0.26757 d (0.26739–0.26775) and 0.26759 d (0.26757–0.26762). 2023, when the nova was bright, drifts: 0.26799 d overall, with the phase moving about 0.13 cycles inside sector 62 and on into 63. An orbit can't change that fast, but the modulated light can [23]. At 0.267606 d the six quiet sectors' phases agree, at 0.72, 0.73, 0.68, 0.64, 0.71 and 0.71 cycles, with errors from 0.008 to 0.09. That isn't significant by itself: the gaps between the epochs are nearly 1:2, so such an alias turns up by chance 15–28% of the time, depending on how wide a range of periods is searched [23]

A separately written script, with no neighbour removal and no binning, finds it clearly in sectors 36 and more weakly in sectors 9 and 10; sector 37 stands out least, and at r = 1.5 sectors 10 and 37 sit inside their controls (script, output). At 0.26760 d in a 1-pixel aperture it gets 0.285, 0.185, 0.432 and 0.143 e^-/s in sectors 9, 10, 36 and 37, above 45, 46, 48 and 28 of 48 control frequencies, and 2.48 in sector 89, above all 48.

OUR ANALYSIS

What it could be

The reading now leans towards the orbit. The signal sits on the nova's pixel before the outburst and after it, its size follows the nova's flux, and 6.4 hours is typical, since most nova periods fall at 3–8 hours [9 §3].

It's still a candidate, from one instrument, with no spectroscopy. The period's agreement across years could be an alias, as the table says. The curve has a harmonic at P/2, and if it's ellipsoidal the orbit would be twice as long, 0.535 d, which matching minima don't exclude. Schaefer lists coherent, non-orbital signals in novae, some of them transient [9 §5], and a superhump or something like it isn't excluded. If this is the orbit, or tied to it, the paper's "close binary" would survive, more plainly if anything, and 1.437 d would not.

OUR ANALYSIS

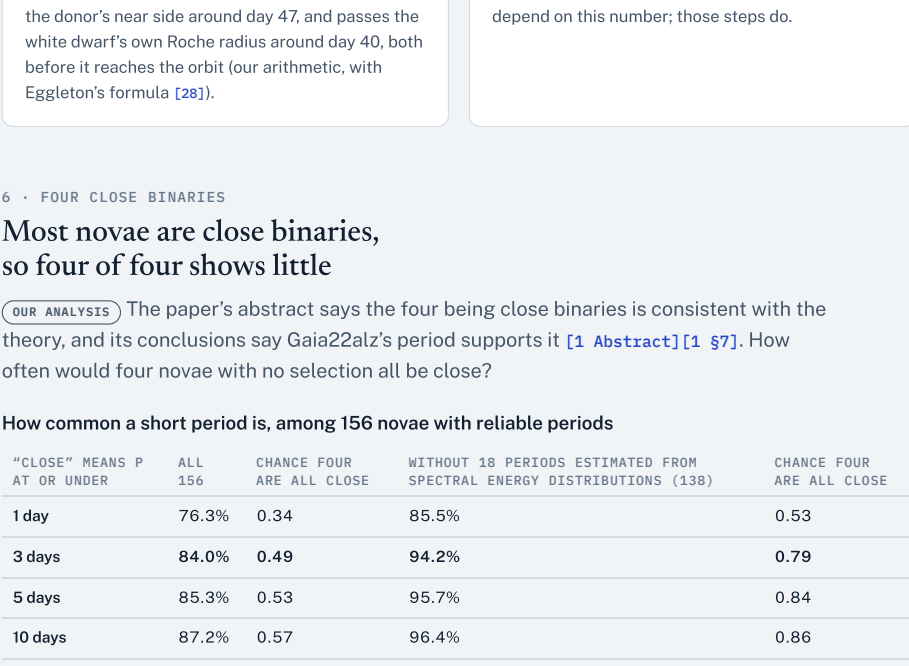
If so: the timing argument

The paper sets the photosphere's radius against the orbit: the companion is engulfed on day 55, after spectra on days 45 and 49 with no P Cygni, and before the weak P Cygni of day 68 [1 §4.3]. Suppose the orbit is 0.268 d. On the fitted model, M06.Ne.11, the photosphere reaches it around day 33–36. So on days 45 and 49 the companion would already be inside, and the paper's stated reason for the missing P Cygni, that it's still outside [1 §4.3], would fail.

But the paper's timing could survive. The 84 revolutions it says may be enough [1 §4.4] would fall around day 56–59, inside the gap between those spectra and day 68. On M06.sol.11, the model of the paper's Fig. 6, they'd fall on day 44–49. So the result depends on the model, and the fitted model is the fair one to judge by.

When each model's photosphere reaches the orbit, for any period

OUR ANALYSIS



Our arithmetic: Kepler's law for a 0.6 M☉ white dwarf, and each model's radius read from its plotted V curve, as the table below explains [1 Fig. 5][3 Fig. 7]. The spectra are Aydi et al.'s [3 p. 1948]. The shaded band is where most nova periods fall [9 §2]. It's a sketch on the paper's own models, not a new model.

What each model gives, for a companion of 0.2–0.8 M☉

IF THE ORBIT IS 0.268 D, OR AS MARKED	M06.NE.11, THE FITTED MODEL	M06.SOL.11
Photosphere reaches the 0.268-d orbit	day 33–36	day 22–27
Revolutions done by day 49	47–59	83–101
84 revolutions reached	day 56–59, inside the gap between the spectra	day 44–49
Reaches a 0.535-d orbit, if the signal is half the orbit	day 41–45	day 34–39
Reaches the paper's 1.437-d orbit	day 54–58; the paper says 55	day 50–54
Reaches the white dwarf's Roche radius, 2.37 R☉ for 1.437 d and 0.2 M☉	day 40	day 32
Reaches the donor's near side, about 3.5 R☉, for the same	day 47	day 41

Our reading, not the authors' calculation. We read each V curve from the vector files of the paper's Figs. 5 and 6, and turn it into a radius with a blackbody of the photosphere's temperature, anchored at the model's point B, 3.78 R☉ at log T = 4.48 [1 §4.3]. This returns the paper's radii at A and C, 0.33 and about 35 R☉. The paper gives its radii for M06.sol.11 [1 §4.3]. On the plotted curves its ~40 days for point A matches that model, and its 47, 55 and 106 days match M06.Ne.11, so we keep the two apart.

Even at 1.437 days the match is loose

The spectra leave a 19-day gap, from day 49 to day 68 [3 p. 1948]. On the fitted model, with the 0.2 M☉ companion assumed [1 §4.3], any period from about 1 to 4.5 days would land in it, and 14 of Schaefer's 156 novae have one [9 Table 6]. For a lobe-filling companion, the photosphere also meets the donor's near side around day 47, and passes the white dwarf's own Roche radius around day 40, both before it reaches the orbit (our arithmetic, with Eggleton's formula [28]).

What else rests on 1.437 days

The comparison with U Sco, the slightly evolved companion and the large disc [1 §6.2], and the high accretion rate used to favour model M06.Ne.11 [1 §3.2]. Aydi et al. note a similarly bright quiescent state in T Pyx [3 p. 1956], a short-period system [9 Table 6]. The paper's transition idea doesn't depend on this number; those steps do.

6 · FOUR CLOSE BINARIES

Most novae are close binaries, so four of four shows little

OUR ANALYSIS The paper's abstract says the four being close binaries is consistent with the theory, and its conclusions say Gaia22alz's period supports it [1 Abstract][1 §7]. How often would four novae with no selection all be close?

How common a short period is, among 156 novae with reliable periods

"CLOSE" MEANS P AT OR UNDER	ALL 156	CHANCE FOUR ARE ALL CLOSE	WITHOUT 18 PERIODS ESTIMATED FROM SPECTRAL ENERGY DISTRIBUTIONS (138)	CHANCE FOUR ARE ALL CLOSE
1 day	76.3%	0.34	85.5%	0.53
3 days	84.0%	0.49	94.2%	0.79
5 days	85.3%	0.53	95.7%	0.84
10 days	87.2%	0.57	96.4%	0.86

Our count from Schaefer's Table 6, drawn without replacement [9 Table 6]. We use 3 days as the primary line because the paper calls KT Eri's 2.62 d close, and PU Vul's 4,894 d and CN Cha's 253 d wide [1 Table 1]. The list holds novae with measured periods, not all novae, and it leaves out symbiotic novae, so it omits systems like PU Vul [9 §7].

SLOW NOVAE, T_3 ≥ 100 D

OUR ANALYSIS

14 of 15, 13 of 15

are at 3 days or less: J class, then every other class. No detectable difference, Fisher's exact p = 1.0, though three wide systems in 30 give that test little power. Four random slow novae are all close 64% of the time [9 Table 6]

LOW-MASS WHITE DWARFS

OUR ANALYSIS

20 of 20

novae at 0.70 M☉ or below with a known period are at 3 days or less, and 12 of them are J class while 8 aren't [10 Table 1]. So a low-mass white dwarf in a close binary doesn't pick out the group

A DEFINITION

OUR ANALYSIS

Requirement 3

of the group is an orbital period under a few days [1 §2.6]. So it can't also count as evidence about the group's members. Gaia22alz was a fair test, since it could have come out wide, but most novae would pass

7 · THE DISPUTE

A model against a hedged reading of two spectra, and nothing yet decides between them

This is a theorists' reading against an observers' reading. We don't pick a winner, because the evidence doesn't. We do check how each reads the other, against the published texts.

What Aydi et al. say

They propose that the spectra of the first 50 days arise in the white dwarf's optically thin envelope or disc, "reprocessing ultraviolet and potentially X-ray emission", and they add "If true" [3 p. 1946]. Their evidence is strong He II and C IV with no P Cygni on days 45 and 49: He II at about twice Hβ, which they say implies a source of a few times 10^5 K [3 p. 1948]. They had no X-ray or UV data, and that lack keeps them from definitive conclusions [3 p. 1954]. They think the disc route less likely, and their main alternative is shocks in an outflow from the L2 point [3 p. 1954]. The later climb, days 50–180, they put down to ejecting the envelope, "possibly aided by the binary motion" [3 p. 1953].

What Kato and Hachisu say

Their model reproduces the rise without irradiation, and its falling temperature fits the spectra's change [1 §5.4]. Its X-ray flux is far too low to lift the optical light, "impossible", they say [1 §5.2]. Other slow novae are as slow [1 §5.1]. Hillman et al.'s model, they say, is counter-evidence [1 §5.2]. They conclude the results contradict Aydi et al.'s assertions on the slow rise and the unusual spectrum [1 §5.4]. The two sides agree on more than that suggests: both give the binary a role in the ejection [1 §7][3 p. 1953].

How the paper reads Aydi et al. and Hillman et al., against their published texts

POINT	WHAT THE PAPER SAYS	WHAT THE PUBLISHED TEXT SAYS
Colours and the companion	Aydi et al. "misunderstood the observed color" as the companion's, and fitted one blackbody [1 §5.2]	They speak of the colours of the system, fit a blackbody and, separately, an optically thick disc, call the blackbody not necessarily ideal, and rule out only a giant, allowing a sub-giant [3 p. 1952]. Fair part each fit has one component
Which radiation	Tests 0.3–1 keV X-rays, and adds that low-mass white dwarfs emit few [1 §5.2][1 §5.3]	Aydi et al. already say so: for a white dwarf of about 0.6–0.8 M☉, the high-energy light is likely "mostly in the far-UV" and the X-ray flux relatively weak [3 p. 1953]. The test doesn't reach the far-UV
Not "unusually" slow	Gaia22alz is no rare exception, given PU Vul and ASAS J174600-2321 [1 §5.1]	Aydi et al. do write "extremely slow and gradual rise" and "its unusual, gradual rise" [3 p. 1954], and "very slow and gradual rise" [3 Abstract], so the paper has a target. But they also say other novae took as long, "even more in some cases", citing these authors; their contrast is how gradual the rise is, from under a magnitude above quiescence, and they allow HR Del may be alike [3 p. 1947]. The slower comparators are symbiotic systems [16][17], which Aydi et al. treat apart [3 p. 1946], and V723 Cas rises faster on the paper's own Fig. 7 [1 §5.1]
"Concluded"	Aydi et al. "concluded" the rise is evidence of reprocessed photons [1 §5]	"We propose", "If true" [3 p. 1946]. The missing data prevent them "from confirming these suggestions" [3 p. 1957]. In a later paper they do write that they concluded this was the likely origin [4 §3]
Why the flux climbs gradually	Aydi et al. give no explanation [1 §5.3]	A fair point. They attribute the early brightening to reprocessing, and offer no calculation of its pace [3 p. 1952]
Hillman's magnitudes	"No definition is given" for them [1 §5.2]	Hillman et al. define them: AB magnitudes of a blackbody through GALEX's near-UV band, 175–280 nm, Swift's XRT and Johnson V [5 p. 1964]
Hillman's model as "counter-evidence"	In the 0.65 M☉ model, UV and X-ray magnitudes are flatter than V after the first 20 days, and V rises without irradiation [1 §5.2]	That's a fair reading of the figure, by eye [5 p. 1965]. But those light curves come from the white dwarf only, and the gas's interaction with its light isn't calculated [5 p. 1975], so they can't test reprocessing. Those two bands also leave out most of a hot star's light (below)

Both groups quote that one model correctly: Aydi et al.'s 60-day UV flash is Hillman et al.'s stated figure for it, which they call exceptional, with the others lasting about 5–10 days [5 p. 1968]; the paper's ~80 days is its rise in V on their Fig. 4, by our eye [5 p. 1965]. Those are different quantities.

OUR ANALYSIS

Where a hot blackbody's energy goes

LOG T	V BAND	NEAR-UV, 175–280 NM	91–175 NM
4.48	1.0%	20%	45%
5.0	0.04%	1.5%	8.6%
5.37	0.003%	0.14%	1.0%

Our arithmetic, for the paper's temperature [1 §4.3][1 §4.4]. At 10^5 K and above, nearly all the energy lies between the bands that the arguments used. Equal AB magnitudes also don't mean equal energy: the near-UV band is about 7 times wider in frequency than V. So being fainter than V in those bands doesn't bound what could be reprocessed. This doesn't show irradiation happened; it shows the argument doesn't exclude it.

OUR ANALYSIS

The crux: He II at twice Hβ

ASSUMPTION	HE II
Thin gas photoionized by a 30,200 K blackbody	4 × 1
The same, at 10^5, 3×10^5, 5×10^5 K, counting photons only	0.12,
Ceiling at any temperature, with all helium He⁺⁺	1.0 fo 1.7 fo 0.13
Dense gas in LTE, optically thin, 30,200 K, n_e 10^{10}–10^{12} cm^{-3}, n(He)/n(H) 0.085–0.136	3.7–
Measured, Gaia22alz, days 45 and 49	about 1.89
Measured, V1405 Cas at +9.88 hours	0.55, 22.5

The paper calls the He II lines "weak", and says log T = 4.48 naturally explains them, citing Taguchi et al. [1 §4.3][14 Fig. 5]. Aydi et al. measure He II at about twice Hβ and stress its strength [3 p. 1948]. Re-measured on the spectra they posted, it's 1.89 and 1.63 times Hβ on days 45 and 49, 1.75–2.2 dereddened, and 0.11 on day 68 [3 p. 1957]. So it isn't weak. By our arithmetic, using standard Case B rates [30], the paper's temperature can make that line if the gas is dense and in LTE, though 3.7–6.4 overshoots what's measured, and can't if a 30,200 K photosphere is photoionizing thin gas. Aydi et al.'s few 10^5 K rests on the second reading, and it has its own problem: with all helium He⁺⁺ the ratio can't pass 12.2 × n(He)/n(H), so the measured 1.6–2.2 sits at or above what photoionization gives at any temperature. Neither paper calculates the ratio for this star. The paper doesn't address the wings to 2,000–2,500 km/s either, which Aydi et al. read as a possible early wind [3 p. 1948][3 p. 1953].

The dip after day 300

Aydi et al. say the decline is "possibly due to dust condensation", and their Table 1 lists dust as Yes [3 p. 1948][3 p. 1954]. The paper would reject that from AAVSO's I band and from Karambelkar et al. [1 §4.5]. Those authors report a steady mid-infrared decline for three novae at about 6-month cadence [15 §2][15 §4.2], and don't discuss dust in Gaia22alz [15 §4.2]. So that's the paper's inference, and it hedges: "we may reject".

What would decide it

- X-ray or UV measurements during the rise of a very slow nova. None exist for this one [3 p. 1953], and wide-field monitors may catch one [13 §2.1].
- A line-formation model of He II at twice Hβ, with C IV, in both regimes.
- This star's true orbital period, which sets the timing (section 5).

Optical colours alone would barely help: at 3 × 10^4 K and 3 × 10^5 K both sources lie near the Rayleigh–Jeans tail (our reasoning). We found no public response from Aydi et al.; the paper's days old.

8 · REPEAT OUR NUMBERS

Scripts fetch the public data and recompute our numbers

The first rules were fixed before any TESS flux was read. Nine later files came after seeing results, each hashed before its run, and each says so: the neighbour, the candidate, the published-text checks and the changes after the separate review aren't blind.

- PY **fetch_public_inputs.py** — Downloads the eight TESS cutouts, the Gaia cone, VSX's records, Aydi et al.'s spectra and four files from arXiv sources, about 255 MB, by URL; standard library only · 5 KB
- PY **run_all.py** — Runs every script below in order, and says which outputs match the hosted ones · 2 KB
- PY **tess_period.py, tess_neighbour.py, tess_followup.py, tess_candidate.py** — TESS photometry, periodograms, maps, the neighbour, injection tests and the candidate, as first run; numpy, with our own FITS reader · 57 KB
- PY **review_tess.py, radius_curves.py** — What changed after the separate review: timed eclipses, both skies, the one-scale removal and limits through it, the 6.4-hour signal before the outburst, periods and phases by epoch, its shape, and radii from the plotted curves · 43 KB
- PY **base_rates.py, extra_counts.py, paper_checks.py, band_shares.py, spectra_check.py** — Catalogue counts, He II ratios, the orbit's arithmetic, blackbody shares and the line ratios in Aydi et al.'s spectra · 27 KB
- PY **read_figures.py, figure_checks.py, chart_data.py** — Read Figs. 5 and 6 from the arXiv source, the fit's numbers, the pixel maps and the charts' numbers · 13 KB
- PY **second_check_location.py, its output; second_check_quiescent.py, its output** — A separately written script, sharing no code with ours, on where the signals sit and on the 6.4-hour signal before the outburst · 13 KB
- JSON **review_tess.json, radius_curves.json** — The numbers on this page for the neighbour's timing, both skies, the one-scale removal, the 6.4-hour signal, and the radii, which derive from the paper's Figs. 5 and 6, CC BY 4.0. The eighth addendum says which earlier results they replace · 67 KB
- JSON **tess_summary.json, tess_neighbour.json, tess_followup.json, tess_candidate.json** — The TESS results as first run, section by section of the rules, kept as the record · 169 KB
- CSV **tess_s89_spectrum_template.csv, tess_s89_amplitude_spectrum.csv** — Sector 89's spectrum with both skies, before and after the one-scale removal, and the first version, with 30 harmonics, kept as the record · 192 KB
- JSON **base_rates.json, extra_counts.json, band_shares.json, spectra_check.json, figure_checks.json, chart_data.json** — Counts, shares, line ratios, residuals, maps and chart data; the last holds points from Fig. 5, CC BY 4.0 · 57 KB
- TXT **paper_checks.txt** — The arithmetic, printed · 3 KB
- TXT **RULES_before_running.txt** — The rules written before any TESS flux was read · 7 KB
- TXT **after section A, after VSX, follow-ups, the candidate, counts, published text, spectra, after the review, after its first run** — The nine later addenda, none of them blind; the last two follow the separate review · 21 KB
- TXT **rules_sha256.txt, inputs_sha256.txt** — Hashes of the rules and of the input files, as recorded before each run · 4 KB

Run it

`python3 -I fetch_public_inputs.py <folder>`, then `python3 -I run_all.py <folder> <output folder>`. After the download, it takes about 20 minutes, with numpy and scipy. The TESS cutouts aren't hosted here. TESScut builds them on request, so a zip's bytes may differ from ours. Everything downloaded is read as data, and nothing in it is run.

The data and their terms

TESS: NASA mission data, public, through MAST [23]. **Gaia DR3:** ESA/Gaia/DPAC, free to use with credit [24]. **VSX:** AAVSO's public index; no account used [26]. **Aydi et al.'s spectra:** their paper's data link, read by a script and not hosted [3 p. 1957]. **ASAS-SN and AAVSO photometry:** only as the paper plotted it. Sky Patrol refused our connections, and AAVSO's data need an account, which we don't use. Gaia Science Alerts' address didn't resolve from our network.

9 · LIMITS

What this check could and couldn't see

Our TESS work hasn't been reviewed outside this site

It's simple aperture photometry and pixel maps in a crowded Galactic-plane field, with 21″ pixels. A separate review within this site caught errors in it, and a second script of ours agrees with the location, but no outside group has checked it, and the authors may hold something the paper doesn't show [1 §6.2].

The candidate came from looking

We found it after removing the neighbour's harmonics, so its false-alarm figures for 2023 and 2025 are for that search, not a test fixed in advance. The test before the outburst fixed its period from 2025 first, but we ran it knowing what a review had already found [23]. Everything on it comes from one instrument.

A figure, not the data

The fit's residuals use the paper's plotted points, with its own shift of g to V, because we could reach neither ASAS-SN nor AAVSO's files [1 Fig. 5].

Catalogues with shared inputs

Schaefer's masses include these authors' own fits [10 §2], and some of the catalogued periods are estimates [9 §3]. The period catalogue takes its classes from Strope et al. where they exist [9 §7].

Arithmetic, not line modelling

The He II figures bracket the regimes, and they aren't a model of this star's spectrum. We measured the ratio on the spectra as Aydi et al. posted them, and didn't re-reduce them [3 p. 1957].

No journal version

The journal's text may change [1].

What would change these verdicts

01

The authors' run, showing a sector and aperture where 1.437 d is centred on the nova; or radial velocities or independent photometry at that period. Either would lift "Unsupported".

02

X-ray or UV data in such a rise, or a He II calculation that one side passes and the other fails, would resolve "Unconfirmed".

Related checks

FALSE A solar micronova? The Disaster Cycle, Fact-Checked

Sources

Bracketed numbers refer to this list. For the paper [1], §, Fig. and Table give a section, figure or table of the arXiv manuscript, Abstract its abstract and p. a page of that PDF. For journal articles read in the publisher's PDF, p. gives the journal's page; for papers read on arXiv, § or Table refers to that version. M☉ is the Sun's mass and R☉ its radius; a magnitude, where a smaller number is brighter; log T the logarithm of temperature in kelvin; S/N signal to noise; e^-/s electrons per second in TESS.

1 Kato, M., and Hachisu, I. (2026). Metamorphic novae I. Gaia22alz – Violent relaxation starting from static evolution. arXiv:2511.05297v1, submitted November 3, 2026; 17 pages, 11 figures. CC BY 4.0. Fig. 5 is adapted with credit, and the radii in section 4 derive from Figs. 5 and 6. arXiv's comment says "accepted for publication in ApJ", and the paper thanks an anonymous referee; on November 4, 2026, arXiv shows no journal reference or journal DOI, and a Crossref title search finds no journal record. Full text, with its source files.

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=8cKdVgQff90, published at 12:23 UT. Its description links the paper [1]. No transcript was available.

3 Aydi, E., Chomiuk, L., Mikołajewska, J., Brink, J., Metzger, B. D., Strader, J., et al. (2023). Catching a nova X-ray/UV flash in the visible? Early spectroscopy of the very slow Nova Velorum 2022 (Gaia22alz). *Monthly Notices of the Royal Astronomical Society* 524, 1946–1964. CC BY 4.0. Full text, from a PDF the site's owner downloaded because the publisher shows our tools a bot check; p. gives the journal's page. We re-measured line ratios in the spectra at the paper's data link (p. 1957), and host none of them.

4 Aydi, E., Chomiuk, L., Strader, J., Sokolovsky, K. V., et al. (2024). Revisiting the classics: on the evolutionary origin of the 'Fe II' and 'He/N' spectral classes of novae. *Monthly Notices of the Royal Astronomical Society* 527, 9303–9321. CC BY 4.0. We read the arXiv version, arXiv:2309.07097, for the passages cited; § refers to it.

5 Hillman, Y., Prialnik, D., Kovetz, A., Shara, M. M., and Neill, J. D. (2014). Nova multiwavelength light curves: predicting UV precursor flashes and pre-maximum halts. *Monthly Notices of the Royal Astronomical Society* 437, 1962–1975. © 2013 The Authors, no open licence, so we paraphrase and redraw nothing. Full text, from a PDF the site's owner downloaded; p. gives the journal's page.

6 Kato, M., and Hachisu, I. (2011). Effects of a companion star on slow nova outbursts: transition from static to wind evolutions. *The Astrophysical Journal* 743, 157. We read arXiv:1109.1499v2; § and Fig. refer to it.

7 Kato, M., and Hachisu, I. (2009). Multiplicity of nova envelope solutions and occurrence of optically thick winds. *The Astrophysical Journal* 699, 1293–1299. Bibliographic record only; we rely on how [6] and [12] describe it.

8 Strope, R. J., Schaefer, B. E., and Henden, A. A. (2010). Catalog of 93 nova light curves: classification and properties. *The Astronomical Journal* 140, 34–62. We read arXiv:1004.3698, with its tables, for the parts on class J.

9 Schaefer, B. E. (2022). Comprehensive listing of 156 reliable orbital periods for novae, including 49 new periods. *Monthly Notices of the Royal Astronomical Society* 517, 3640–3659. We read arXiv:2207.02932 and counted its Table 6 from the arXiv source; § and Table refer to it. Numbers only.

10 Schaefer, B. E. (2025). Comprehensive listing of 208 nova white dwarf masses as the primary determinant of spectral class and light-curve class. *The Astrophysical Journal* 993, 232. CC BY 4.0. We read arXiv:2511.04787 and counted its Table 1 from the arXiv source.

11 Serna, J., Hernández, J., Matt, S. P., et al. (2026). TESSExtractor: a web-based interactive tool for light-curve visualization and period estimation using TESS full-frame images. arXiv:2608.25113v1, submitted to *RAS Techniques and Instruments*, not yet peer reviewed as far as the record shows. The tool is at tessextractor.app; it needs a browser, so we didn't run it.

12 Shen, K. J., and Quataert, E. (2022). Binary interaction dominates mass ejection in classical novae. *The Astrophysical Journal* 938, 31. CC BY 4.0. We read arXiv:2205.06283, for the abstract and §4.

13 Chomiuk, L., Metzger, B. D., and Shen, K. J. (2021). New insights into classical novae. *Annual Review of Astronomy and Astrophysics* 59, 391–444. We read arXiv:2011.08751, for the sections cited.

14 Taguchi, K., Maeda, K., Maehara, H., Tajitsu, A., et al. (2023). Spectra of V1405 Cas at the very beginning indicate a low-mass ONeMg white dwarf progenitor. *The Astrophysical Journal* 958, 156. CC BY 4.0. We read arXiv:2310.08641, for the passages cited.

15 Karambelkar, V. R., De, K., Hillenbrand, L. A., Sokoloski, J. L., et al. (2026). SPHEREx as a frontier for infrared transients: classification of new Galactic FU Ori outbursts and classical novae. *The Astrophysical Journal Letters* 1000, L8. CC BY 4.0. We read arXiv:2602.07129, for §2 and §4.2.

16 Hümmerich, S., Otero, S., Tisserand, P., and Bernhard, K. (2015). The curious case of ASAS J174600-2321.3: an eclipsing symbiotic nova in outburst? *Journal of the American Association of Variable Star Observers* 43, 14. Title and opening read.

17 Hambsch, F.-J., Hümmerich, S., Bernhard, K., and Otero, S. (2015). New photometric observations and the 2015 eclipse of the symbiotic nova candidate ASAS J174600-2321.3. *Journal of the American Association of Variable Star Observers* 43, 213. Title and opening read.

18 Steinberg, E., and Metzger, B. D. (2020). Internal shocks from variable outflows in classical novae. *Monthly Notices of the Royal Astronomical Society* 491, 4232–4246. We read arXiv:1908.01700, for the passage citing [6].

19 Das, R., Banerjee, D. P. K., Nandi, A., Ashok, N. M., and Mondal, S. (2015). Near-infrared studies of V5558 Sgr: an unusually slow nova with multiple outbursts. *Monthly Notices of the Royal Astronomical Society* 447, 806–816. We read arXiv:1411.6524, for the passage citing [6].

20 Metzger, B. D., Zenati, Y., Chomiuk, L., et al. (2021). Transients from the cataclysmic deaths of cataclysmic variables. *The Astrophysical Journal* 923, 100. We read arXiv:2108.04305, for the passage citing [6].

21 Lynden-Bell, D. (1967). Statistical mechanics of violent relaxation in stellar systems. *Monthly Notices of the Royal Astronomical Society* 136, 101–121. Bibliographic record only.

22 OpenAlex. Works citing Kato and Hachisu (2011). Read November 4, 2026. We separated those with Kato or Hachisu among the authors by name.

23 NASA's Transiting Exoplanet Survey Satellite, full-frame images of sectors 9, 10, 36, 37, 62, 63, 89 and 90, through MAST's TESScut (Brasseur et al., Astrocut, 2019). 15 × 15 pixels at Gaia22alz, fetched November 4, 2026, with no account. All measurements from them on this page are our own analysis, in the scripts hosted here. Public data; we credit the TESS mission and MAST.

24 Gaia Collaboration (2023). Gaia Data Release 3: summary of the content and survey properties. *Astronomy & Astrophysics* 674, A1. Data through the Gaia Archive, read November 4, 2026: Gaia DR3 5307057922488654848 (Gaia22alz) and every source within 2′. Credit: ESA/Gaia/DPAC.

25 Bailer-Jones, C. A. L., Rybizki, J., Fouesneau, M., Demleitner, M., and Andrae, R. (2021). Estimating distances from parallaxes. V. Geometric and photogeometric distances to 1.47 billion stars in Gaia Early Data Release 3. *The Astronomical Journal* 161, 147. Distances through the Gaia Archive: 6461 pc geometric and 6194 pc photogeometric for Gaia22alz, which match the paper's.

26 AAVSO, International Variable Star Index (VSX), read November 4, 2026, with no account: Gaia22alz, which lists no period, and ASASSN-V J092955.42-561646.0, type EA, period 5.6946 d, epoch 2457727.742, V 13.66–13.99.

27 Stassun, K. G., Oelkers, R. J., Paegert, M., et al. (2019). The revised TESS Input Catalog and Candidate Target List. *The Astronomical Journal* 158, 138. We read arXiv:1905.10694 for its relation between Gaia and TESS magnitudes.

28 Eggleton, P. P. (1983). Approximations to the radii of Roche lobes. *The Astrophysical Journal* 268, 368. Cited as the formula's source; not read.

30 Osterbrock, D. E., and Ferland, G. J. (2006). *Astrophysics of Gaseous Nebulae and Active Galactic Nuclei*, 2nd edition. University Science Books. The source of the Case B recombination values at 10^4 K in our arithmetic. Cited for those values; not re-read for this page.

METHOD

How this was checked

On November 4, 2026, we read the paper in full on arXiv, with its source files and vector figures, and checked its claims about Gaia22alz and about Aydi et al. against Aydi et al. (2023) and Hillman et al. (2014), read in full from PDFs the site's owner downloaded, because their publisher shows our tools a bot check. We also read the 2011 theory paper, the J-class catalogue, Schaefer's catalogues of periods and masses, and the passages cited in twelve other papers, as the source list marks. arXiv shows no journal reference, and Crossref no journal record, so there's no journal version to compare. 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 what the paper's proposed class adds, what the model's fit does and doesn't show, the counts from Schaefer's catalogues, the arithmetic on the orbit, blackbody shares and He II, and all of the TESS work. The TESS work bears on a paper not yet in the journal, and it hasn't been reviewed by anyone outside this site. We can't say what the authors ran, because the paper names no sector, aperture or uncertainty, and a weak real signal near 1.437 days isn't excluded. The 6.4-hour signal is a candidate from one instrument, which we found by looking; only its test before the outburst fixed the period first.

A separate review of the built page, within this site's own process and before publication, caught errors in our analysis: a false negative on the 6.4-hour signal before the outburst, a removal test that couldn't fail, a fold on the wrong period, a sky estimate that inflated some numbers, a count that removed 25 periods instead of 18, and timing arithmetic that ran through two models. We re-derived those numbers in our own scripts under two further hashed addenda, which say these changes follow that review. The change log below lists what changed. None of it moved a verdict.

The hosted scripts fetch the public TESS, Gaia and VSX data and four files from arXiv sources by URL, and recompute our numbers: tess_period.py, tess_neighbour.py, tess_followup.py, tess_candidate.py, review_tess.py, radius_curves.py, base_rates.py, extra_counts.py, paper_checks.py, band_shares.py, spectra_check.py, figure_checks.py and chart_data.py, run by run_all.py. A run in an empty folder gave the outputs we host byte for byte. It re-downloaded its inputs except TESS sectors 89 and 90: TESScut answered sector 89 with a server error at first, so it used our saved copies of those two, and the later downloads hold the same fluxes. TESScut's zips differ in their own bytes. We wrote rules before reading any TESS flux; nine later addenda, each hashed before its run, say what came after seeing results, and the neighbour and the candidate both did. A separately written script, sharing no code with ours, re-ran the location in sectors 37 and 89 and the signal before the outburst, and agrees (location, before the outburst). We re-measured Hβ and He II against Hβ in the spectra Aydi et al. posted, without re-reducing them. We could not reach ASAS-SN's Sky Patrol or Gaia Science Alerts from our network, and AAVSO's data need an account, which we don't use, so the fit to Fig. 5 uses the points as the paper plotted them. We didn't run the TESSExtractor tool itself.

On November 6, 2026, we revised the page to review the paper on its own. No transcript of the episode that linked it was available, and without one the site no longer comments on how an episode presented a paper. So the verdict on the episode's title and its label for the paper is gone, with section 2's reasoning for that verdict and a note on two earlier episodes, and section 2 now covers the paper's proposed class alone. No check of the paper changed, and the verdicts on its claims are unchanged. A fresh review of the revision led to smaller changes: section 1 holds the line on S0 News and has its citation back, section 2's lead counts the proposed class among what is new, and two passages on Schaefer's catalogues no longer use pronouns.

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.
UNSUPPORTED	No evidence we could find backs it up, though it hasn't been strictly disproven.
UNCONFIRMED	Rests on a preliminary result that hasn't been confirmed.

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 it was available, and without one the site no longer comments on how an episode presented a paper. The verdict on the episode's title and the link's label is removed, and so are section 2's reasoning for that verdict and its note on two earlier episodes, with their source, number 29; the other sources keep their numbers. Section 2 now covers the paper's proposed class alone, and the verdicts on the paper's claims are unchanged. A fresh review of the revision then moved the line on S0 News into section 1, restored a citation there, matched section 2's lead to its box on what is new, and reworded two passages on Schaefer's catalogues.
Nov 4, 2026	Before publication, a separate review of the built page found errors in our own analysis, and we corrected them. The 6.4-hour signal, which we'd called absent before the outburst, is there in 2019 and 2021 with a cleaner sky estimate, and only 2023 drifts in period. Removing 30 harmonics can't test for a 1.437-day signal, so we now remove the neighbour with one scale factor and give limits through that removal. The neighbour's fold now uses timed eclipses, which changes 2025's depths and fills in 2023. Eclipses and amplitudes come with two sky estimates. The catalogue column now removes 18 periods, not 25, so 84–98% and 49–91% become 84–94% and 49–79%. The timing arithmetic now reads each model's plotted curve: on the fitted model, the paper's timing could survive at 6.4 hours, and only its stated reason for no P Cygni on days 45–49 fails. The fit is quoted from day 29, the first plotted point. None of this moved a verdict.
Nov 4, 2026	Published on factchecked.science after a full check against the sources. Built from the paper, the published papers it disputes and cites, catalogues of nova periods and masses, public TESS and Gaia data and our own analysis of them, which no one outside this site has reviewed. Fig. 5 of the paper is adapted under CC BY 4.0.

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