

The Strongest Period in the Record Is the Weakest in the Forcing

— The hundred-thousand-year component is only **1/20** of precession in the insolation, yet it is the largest in the glacial record — the gains are **0.35**, **0.92** and **20.00**, a spread of **57.1** — the ordering is reversed — [Paper 432]

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— *From thinking to syncing.* —

Abstract

When periods agree, one wants to conclude that the cause is found. This paper shows that the periods can agree while the ordering of strengths is reversed—and that the reversal itself can be measured. No new theorem or law is claimed. First, the three orbital elements have periods of 23000, 41000 and 100000 years, contributing 1.00, 0.60 and **0.05** to the insolation (Section 2). Second, this is the core of the paper. The component weakest in the insolation is the largest in the glacial record. The ordering is reversed (Section 3). Third, the gains are 0.35, 0.92 and **20.00**, the largest exceeding the smallest by **57.1** (Section 3). Fourth, precession contributes exactly **20** times the hundred-thousand-year component (Section 2). Fifth, **41000** does not divide 100000; the remainder is **18000** years, so it cannot be built by superposition (Section 4). Sixth, the separator is whether the periods agree or the ordering of strengths does (Section 4).

Scope of this paper (scope note): No new theorem or law is claimed—the periods of the orbital elements, the computation of insolation, and the spectral analysis of glacial records are all standard, and the difficulty of the hundred-thousand-year period has long been noted. No answer is offered—why that component is amplified is not answered here. Only the size of the amplification is put into numbers. No climate is predicted—neither future glaciations nor present change is the subject. The amplitudes are not asserted as measurements—1.00, 0.60, 0.05 and 0.35, 0.55, 1.00 are representative for exposition and vary with latitude, season and the kind of record. Methods of spectral analysis are not discussed—windowing, dating error and non-stationarity of the record are not the subject. No explanation is denied—ice-sheet dynamics, carbon dioxide and nonlinearities of deposition have all been proposed. None is denied or endorsed here. Relation to earlier papers: Paper 431 showed that a river bends with nothing to bend around—there placing the cause outside was the error; here the orderings on the cause and effect sides disagree. Paper 300 showed that common root and distinct root can be decided, and that numerical agreement alone does not establish a common root—this paper is an instance where that criterion bites: the periods agree and the strengths do not. Paper 423 showed that a right table still loses—there too, what agreed and what could be used were different. Paper 418 showed that light has two angular momenta—here too, three components are superposed in one record. What is added is setting the periods and amplitudes of three components side by side on both sides, computing the gains and putting the reversal into numbers, giving the spread as 57.1, showing that 41000 does not divide 100000 with a remainder of 18000 years, and placing the separator at “period or strength”.

1. Notation and the Question

Setting: The Earth’s orbit varies slowly through three elements. Precession (about 23000 years), obliquity (about 41000) and eccentricity (about 100000). Each alters the insolation at high latitude; measure the amplitude of each with precession set to 1. Separately, decompose a glacial record by frequency and measure its amplitudes with the hundred-thousand-year component set to 1.

Observation 1.1

When periods agree, the cause looks settled. A hundred-thousand-year wave in the record, and one in the orbit—one wants to connect them.

Observation 1.2

But agreement has two levels. That the periods agree, and that the ordering of strengths agrees—connecting on the first alone is what Paper 300 forbids.

Question: Does the ordering of strengths agree.

2. In the Insolation, a Hundred Thousand Years Is Weakest

Computation 2.1: Set the periods of the three elements against their contributions to the insolation.

Element	Period [yr]	Insolation amplitude (precession = 1)
Precession	23000	1.00
Obliquity	41000	0.60
Eccentricity	100000	0.05

Observation 2.2

Eccentricity contributes least.Exactly **1/20** of precession—because changing the eccentricity barely alters the total insolation the Earth receives.

Observation 2.3

Precession and obliquity redistribute the seasons strongly.Summer insolation moves by tens of watts per square metre—these are the strong drivers.

Observation 2.4

So on the cause side, a hundred thousand years is a minor part.The weakest of the three—that is one half of the fact.

3. In the Record, a Hundred Thousand Years Is Strongest

Computation 3.1: Set the amplitudes in the record and take the gain (record over insolation).

Element	Insolation	Record	Gain
Precession	1.00	0.35	0.35
Obliquity	0.60	0.55	0.92
Eccentricity	0.05	1.00	20.00

Observation 3.2

The ordering is reversed. The smallest in the insolation is the largest in the record—not merely a weak thing appearing weakly.

Observation 3.3

The gains span a factor of **57.1.20.00** against 0.35—one system treating three periods with three different multipliers.

Observation 3.4

Precession’s gain is below 1.0.35—the most strongly driven component is the most strongly cut in the record.

Observation 3.5

A linear response does not do this. Under linearity the gain is a smooth function of frequency—a difference large enough to reverse the ordering does not fit inside that frame.

4. The Separator

The separator: do the periods agree, or does the ordering of strengths.

Observation 4.1

The periods agree. A hundred-thousand-year wave on both sides—looked at alone, the correspondence appears perfect.

Observation 4.2

The ordering of strengths does not. Weakest in the cause, strongest in the effect—two columns of the same table pointing opposite ways.

Observation 4.3

This is exactly the criterion of Paper 300. Numerical agreement alone does not establish a common root—one number, the period, agreeing is not enough to connect a forcing to a response.

Computation 4.4: Close another possibility: can a hundred thousand years be built from 41000?

Dividing 100000 by 41000 leaves a remainder of **18000** years. It is not a divisor.

Observation 4.5

So the hundred-thousand-year wave does not arise as an integer multiple of the other two. It is an independent component—which closes the explanation “it only looks like a coincidence of overlaps”.

Observation 4.6

To be honest—this paper does not answer why it is amplified. Ice-sheet dynamics, greenhouse gases and nonlinearities of deposition have all been proposed—none is denied or endorsed. What is shown is the size of the amplification.

Observation 4.7

One last thing—that the gain is not 1 is itself information. Were it 1, “it passed straight through” would suffice—a spread of **57.1** says something sits in between, and this number is the clue for finding it.

5. Roll Call and Closing

1. Periods of **23000, 41000, 100000** yr (Computation 2.1): **three components.**
2. Insolation amplitudes **1.00, 0.60, 0.05** (Computation 2.1): **the longest is weakest.**
3. Precession is exactly **20** times (Observation 2.2): **on the cause side.**
4. Record amplitudes **0.35, 0.55, 1.00** (Computation 3.1): **the longest is strongest.**
5. The ordering is reversed (Observation 3.2): **the core.**
6. Gains of **0.35, 0.92, 20.00** (Computation 3.1): **all three differ.**
7. A spread of **57.1** (Observation 3.3): **within one system.**
8. Precession’s gain is below **1** (Observation 3.4): **most driven, most cut.**
9. **100000 mod 41000** is **18000** yr (Computation 4.4): **not a divisor.**
10. The separator is period or strength (Observation 4.3): **the criterion of Paper 300.**

Closing: When periods agree, the cause looks settled—a hundred-thousand-year wave in the record and one in the orbit invite connection. But agreement has two levels: that the periods agree, and that the ordering of strengths agrees. On the cause side, a hundred thousand years is the weakest—the three orbital elements contribute **1.00, 0.60** and **0.05** to the insolation with precession set to **1**, eccentricity being exactly **1/20** of precession. Changing the eccentricity barely alters the total insolation received, while precession and obliquity redistribute the seasons strongly. Yet in the record, a hundred thousand years is the strongest—the recorded amplitudes are **0.35, 0.55** and **1.00**, giving gains of **0.35, 0.92** and **20.00**. The ordering is reversed; this is not merely a weak thing appearing weakly. The gains span a factor of **57.1**, one system treating three periods with three different multipliers, and the most strongly driven component, precession, is the most strongly cut at **0.35**. Under a linear response the gain would be a smooth function of frequency, so a difference large enough to reverse the ordering does not fit inside that frame. One thing separates them—do the periods agree, or does the ordering of strengths. The periods agree, and looked at alone the correspondence appears perfect; the ordering does not, and two columns of the same table point opposite ways. This is exactly the criterion of Paper 300: numerical agreement alone does not establish a common root, and one number agreeing is not enough to connect a forcing to a response. Another possibility can be closed too: dividing **100000** by **41000** leaves a remainder of **18000** years, so the long wave does not arise as an integer multiple of the others and is an independent component. To be honest—this paper does not answer why it is

amplified. Ice-sheet dynamics, greenhouse gases and nonlinearities of deposition have all been proposed, and none is denied or endorsed. What is shown is the size of the amplification. One last thing—that the gain is not 1 is itself information. Were it 1, “it passed straight through” would suffice; a spread of **57.1** says something sits in between, and this number is the clue for finding it.

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