Neutrino Oscillation Fixes Only the Differences of the Squared Masses, Not the Masses Themselves

— Shifting every squared mass by the same amount leaves every probability unmoved and moves only the shape of the endpoint — the separator is whether one measures oscillation or the β-decay endpoint — [Paper 1071]

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— *From thinking to syncing.* —

Abstract

A neutrino changes its type while it flies.The formula for that probability contains only differences of squared masses, never the masses themselves.This paper counts that "differences only" with three-flavour mixing and shows that the quantity answering to the absolute scale instead is the shape of the β-decay endpoint.No new theorem or law is claimed. First, and this is the core of the paper: shifting every squared mass by the same amount leaves the oscillation probabilities unmoved. Over both orderings and four phases, with the lightest mass moved from 0 to 0.45 eV, what remains in double precision never exceeds 0.519400 times the rounding size of the phase, and at 60 digits it is 3.889×10^{-62}. Meanwhile the mass sum moves from 0.058980 eV to 1.352886 eV. Second, the endpoint takes the same shift exactly as it is: the square of the effective mass read at the endpoint moves by exactly the size of the shift (discrepancy 2.776×10^{-17}), and the deficit of electrons within 1 eV of the endpoint moves from 1.169834×10^{-4} to 2.879142×10^{-1}. Third, the 4 in the denominator of the phase is a product of 2 and 2. One half comes from expanding the energy and one half from the half-angle; the formula with 4 agrees with the probability computed directly from the amplitude to 4.413×10^{-15}, while mistaking it for 2 or 8 misses by 9.888×10^{-1}. Fourth, the practical coefficient moves with the units and the 4 does not: the coefficient 1.266933 moves by a factor 10^6 across five sets of units, while the denominator recovered from it is 4.000000000000 every time. Fifth, the 4π of the oscillation length is not a solid angle. When the spatial dimension is moved from 1 to 5, the area of the unit sphere moves from 2.000000 to 26.318945, while the coefficient of the oscillation length stays at 12.566370614. The two are the same number only in three dimensions. Sixth, the differences fix only a floor: the mass sum is at least 0.058980 eV for the normal ordering and 0.099824 eV for the inverted one, and the direct-measurement bound of 0.45 eV lies 50.94 and 9.14 times above the smallest effective mass. Stated plainly, "does not fix" is exact as a formula only within the approximation that expands the energy around the momentum. In the unexpanded formula the shift leaks very slightly (4.485×10^{-17} in a reactor-type setting). **Keywords**: neutrino oscillation, squared-mass difference, mixing matrix, β-decay endpoint, effective mass, common phase, beats, separator.

Scope of this paper (scope note): No new theorem or law is claimed: the oscillation probability formula, the three-flavour mixing matrix, the vanishing of a common phase from probabilities, and the response of the β-decay endpoint to mass are all standard. Squared masses are not read as areas: the square entering the oscillation formula is, in natural units, an energy squared and carries no dimension of area. No special value is placed on the mass: every value used is a measured one. Matter effects are not included; only oscillation in vacuum is treated. Wave packets, and the choice between equal momentum and equal energy, are not entered. When the unexpanded formula is measured, states are compared at equal momentum. No fourth type is added; only three-flavour mixing is treated. Majorana versus Dirac is not discussed; double β decay is not treated either. No bound from cosmological observation is cited: the sources have not been checked, so no value for an upper bound on the mass sum is written. The CP phase is not fixed. Four values are measured, and the conclusion is checked to be the same for each. Nothing is called one root: the one half of kinetic energy and the one half of oscillation are two limits of one formula and, by the rule of an earlier census, are not called one root. Relation to earlier papers: Paper 913 showed that the one half of kinetic energy is the reciprocal of the power 2; here the one half of oscillation is counted as coming from the same formula with momentum and mass exchanged. Paper 600 counted that calling two consequences of one formula one root is no judgement at all. Following that rule, the two halves are not called one root. Paper 1060 showed that in a system with only one scale factor the ratio is determined but the position is not. Here too something is fixed and something is not, but the freedom differs: there it is multiplicative, here additive. Paper 60, in its second edition, wrote that a chosen 4π for mass and the 4π of solid angle are different in nature; here the 4π of the oscillation length is added to the comparison and separated from solid angle by moving the dimension. Paper 1055, Paper 1056 and Paper 1058 separated numbers that move with the units from numbers that do not; here the practical coefficient is of the first kind and the denominator 4 of the second. Paper 672 and Paper 649 treated beats between two frequencies. Here the same rewriting is seen to lead to different conclusions depending on what is measured. Paper 300 showed that whether two things share a root is decidable. By that criterion, the 4π of the oscillation length and solid angle are judged to have different roots. What is added is: **measuring with three flavours that shifting every square by the same amount leaves the probabilities unmoved, showing that the effective mass at the endpoint takes that same shift exactly, splitting the 4 of the phase into two halves, setting side by side that the coefficient moves with the units while the 4 does not, separating the 4π of the oscillation length from solid angle by the dimension, and measuring the size of the leak in the unexpanded formula.**

1. The question and the shape of the answer

Neutrinos are born in three flavours, electron, muon and tau, and change into another flavour as they fly.This is neutrino oscillation, confirmed since the observation of atmospheric neutrinos (Fukuda et al. 1998).The idea of mixing itself goes back to Maki, Nakagawa and Sakata (1962) and to Pontecorvo (1968).

For two flavours, the transition probability is written in practical form as

$$P = \sin^2 2\theta \, \sin^2\left(1.267 \, \frac{\Delta m^2 \, L}{E}\right)$$

(with Δm^2 in eV^2, L in km, E in GeV).The formula contains only the difference of squared masses Δm^2, not the masses themselves.

This paper checks that “differences only” numerically.It measures with three-flavour mixing that shifting every squared mass by the same amount leaves the probabilities unmoved, and shows that the quantity answering to the absolute scale instead is the shape of the β-decay endpoint.Along the way it separates the origins of the 1.267 and the denominator 4 in the practical formula, and of the 4π in the oscillation length.

The inputs are as follows.Mixing angles and squared-mass differences are taken from the PDG 2024 listings (Navas et al.), and the direct-measurement bound from KATRIN 2025 (Aker et al.).The $\hbar c$ used for conversion is built from the SI defining values (h, c, e) and comes to 197.3269805 MeV fm.The CP phase δ is not fixed; four values, 0, $\pi/2$, π and $3\pi/2$, are measured.

quantity	value
Δm^2_{21}	7.53×10^{-5} eV^2
Δm^2_{32} (normal ordering)	2.455×10^{-3} eV^2
Δm^2_{32} (inverted ordering)	-2.529×10^{-3} eV^2
$\sin^2\theta_{12}$	0.307
$\sin^2\theta_{13}$	0.0219
$\sin^2\theta_{23}$	0.553 (normal), 0.558 (inverted)
direct-measurement bound	0.45 eV (90 percent), best fit $m^2 = -0.14$ eV^2

2. The 4 of the phase is a product of 2 and 2

A particle of momentum p and mass m has energy $E = \sqrt{p^2 + m^2}$.For two mass eigenstates compared at equal momentum, the energy difference is written exactly by the identity

$$E_2 - E_1 = \frac{m_2^2 - m_1^2}{E_1 + E_2}.$$

The difference of squares appears in it as it stands.

The first one half comes from the denominator $E_1 + E_2$ being nearly $2p$.Expanding, $E - p$ approaches $m^2/(2p)$, and the ratio $(E - p) \cdot 2p/m^2$ approaches 1 as in the table below.The gap to 1 shrinks in the form $(m/p)^2/4$.

p/m	$(E-p)\cdot 2p/m^2$	$(E-m)\cdot 2m/p^2$ (same value of m/p)	$1-$ratio	$(m/p)^2/4$
10	0.997512422417805	0.997512422417805	$\mathbf{2.487578\times10^{-3}}$	$\mathbf{2.500000\times10^{-3}}$
100	0.999975001249922	0.999975001249922	$\mathbf{2.499875\times10^{-5}}$	$\mathbf{2.500000\times10^{-5}}$
1000	0.999999750000125	0.999999750000125	$\mathbf{2.499999\times10^{-7}}$	$\mathbf{2.500000\times10^{-7}}$
10000	0.999999997500000	0.999999997500000	$\mathbf{2.500000\times10^{-9}}$	$\mathbf{2.500000\times10^{-9}}$
1000000	0.999999999999750	0.999999999999750	$\mathbf{2.500000\times10^{-13}}$	$\mathbf{2.500000\times10^{-13}}$

The second and third columns do not differ in a single digit (largest difference 0.000).The third column has the kinetic-energy form $(E-m)\cdot 2m/p^2$, and exchanging the roles of momentum and mass turns it into the formula of the second column.Paper 913 showed that the one half of kinetic energy is the reciprocal of the power 2; the one half of oscillation here is that same formula expanded at the opposite end.Being two limits of one formula, they are not called one root (the rule of Paper 600).

The second one half comes from the probability being the square of an amplitude.The interference term of two states is half of $1-\cos(\Delta EL)$, which the half-angle identity turns into $\sin^2(\Delta EL/2)$ (largest discrepancy 2.220×10^{-16}).

Multiplying the two, the phase becomes $\Delta m^2 L/(4E)$.Compared with the probability computed directly from the amplitude $\cos^2\theta+\sin^2\theta e^{-i\Delta EL}$, the formula with denominator 4 agrees to $\mathbf{4.413}\times10^{-15}$, while formulas with the denominator mistaken for 2 or 8 miss by $\mathbf{9.888}\times10^{-1}$.The setting is $\Delta m^2=2.455\times10^{-3}$ eV^2, $E=1$ GeV, $\sin^2\theta=0.553$, and L from 1 to 3000 km.

3. The practical coefficient moves with the units, and the 4 does not

The practical coefficient is the natural-unit $1/4$ multiplied by a unit conversion.Because the conversion contains $\hbar c$, the coefficient moves by whole orders of magnitude when the units change.Taking $\hbar c$ and the conversion back out and recovering the denominator, 4 returns in every set of units.

units (Δm^2, L, E)	coefficient	recovered denominator
eV^2, km, GeV	1.266933	4.000000000000
eV^2, m, MeV	1.266933	4.000000000000
eV^2, km, MeV	1.266933×10^{3}	4.000000000000
eV^2, m, eV	1.266933×10^{6}	4.000000000000
eV^2, cm, keV	1.266933×10^{1}	4.000000000000
natural units ($\hbar = c = 1$)	0.250000	—

The ratio of the largest to the smallest coefficient is 1.000×10^{6}, and the 4 never moves.Even from the rounded 1.267 the recovered denominator is 3.999787, staying near 4.Paper 1055 showed that the digits of the speed of light are set by the choice of units, and Paper 1056 that the fine-structure constant does not move with the units; here both kinds live inside one formula.The 1.266933 is a number set by the units; the 4 is a number set by the structure.

4. The 4π of the oscillation length is not a solid angle

The distance over which the probability completes one cycle (the oscillation length) is $4\pi E/\Delta m^2$ in natural units and 2.479684 km $\times (E/\mathrm{GeV})/(\Delta m^2/\mathrm{eV}^2)$ in practical units.With $\Delta m^2 = 2.455 \times 10^{-3}$ eV^2 and $E = 1$ GeV, bisecting for the distance at which the unexpanded phase reaches 2π gives 1010.054570 km, and the coefficient recovered from it was 12.566370614359.

This 4π breaks down into the 2 of the expansion, the 2 of the half-angle, and the period π of $\sin^2$.Nowhere does “all directions” enter.

To check this, the spatial dimension d is moved.The flux from a point source thins by division by the area of the unit sphere S_{d-1}.The oscillation phase, by contrast, is set by the magnitude of the momentum alone.Taking the momentum in a random direction in d dimensions and measuring the coefficient gives the following.

d	area of unit sphere S_{d-1}	coefficient of oscillation length
1	2.000000	12.566370614
2	6.283185	12.566370614
3	12.566371	12.566370614
4	19.739209	12.566370614
5	26.318945	12.566370614

The area of the unit sphere moves by a factor 13.159473 between largest and smallest, while the coefficient of the oscillation length does not move.The two are the same number only in three dimensions.Since moving the dimension moves only one of them, by the criterion of Paper 300 they have different roots.Paper 60, in its second edition, wrote that a chosen 4π for mass and the 4π of solid angle differ in nature; the 4π of the oscillation length likewise has an origin other than solid angle.

5. Shifting every square by the same amount leaves the probabilities unmoved

With three flavours, the amplitude for a transition such as muon type to tau type is written

$$A_{\alpha\beta} = \sum_{i=1}^{3} U_{\alpha i}^{*} U_{\beta i}\, e^{-i m_i^2 L/(2E)}$$

(U is the mixing matrix, in the form with the energy expanded around the momentum).Adding the same c to every m_i^2 multiplies every term by the same factor $e^{-icL/(2E)}$.A common factor vanishes when the absolute square is taken, so the probabilities do not change.

This was measured.The departure of the mixing matrix from unitarity is at most 2.220×10^{-16}.With L/E at 500 points from 10 to 10^5 km/GeV, nine transitions and four phases, the largest movement of the probabilities when the lightest mass is moved is as follows.

ordering, lightest mass	probability movement	largest phase	its rounding	mass sum	effective mass
normal, 0 eV	0	641.1	1.424×10^{-13}	0.058980	0.008833
normal, 0.01 eV	4.552×10^{-14}	666.5	1.480×10^{-13}	0.074527	0.013343
normal, 0.05 eV	5.512×10^{-14}	1274.6	2.830×10^{-13}	0.171672	0.050774
normal, 0.10 eV	2.335×10^{-13}	3175.0	7.050×10^{-13}	0.312315	0.100389
normal, 0.45 eV	4.480×10^{-12}	51951.9	1.154×10^{-11}	1.352886	0.450087
inverted, 0 eV	0	640.8	1.423×10^{-13}	0.099824	0.049220
inverted, 0.01 eV	7.683×10^{-14}	666.2	1.479×10^{-13}	0.111808	0.050225
inverted, 0.05 eV	9.803×10^{-14}	1274.3	2.829×10^{-13}	0.191298	0.070161
inverted, 0.10 eV	2.427×10^{-13}	3174.7	7.049×10^{-13}	0.323529	0.111457
inverted, 0.45 eV	3.847×10^{-12}	51951.6	1.154×10^{-11}	1.355519	0.452684

The movement of the probabilities looks larger as the lightest mass grows.But that is because the phase grows and with it the double-precision rounding; dividing the movement by the rounding size gives at most 0.519400 .Meanwhile the mass sum moves from 0.058980 eV to 1.352886 eV in the normal ordering.The effective mass (Section 8) moves from 0.008833 eV to 0.450087 eV.

Two controls are set.Multiplying every square by 1.01 instead of adding moves the probabilities by up to 0.864572 .Shifting only the third square by 10^{-4} eV^2 moves them by 0.905228.Nothing moves only when the same amount is added to all.With two flavours, reversing the sign of the difference does not move the probability either (largest difference 0.000).

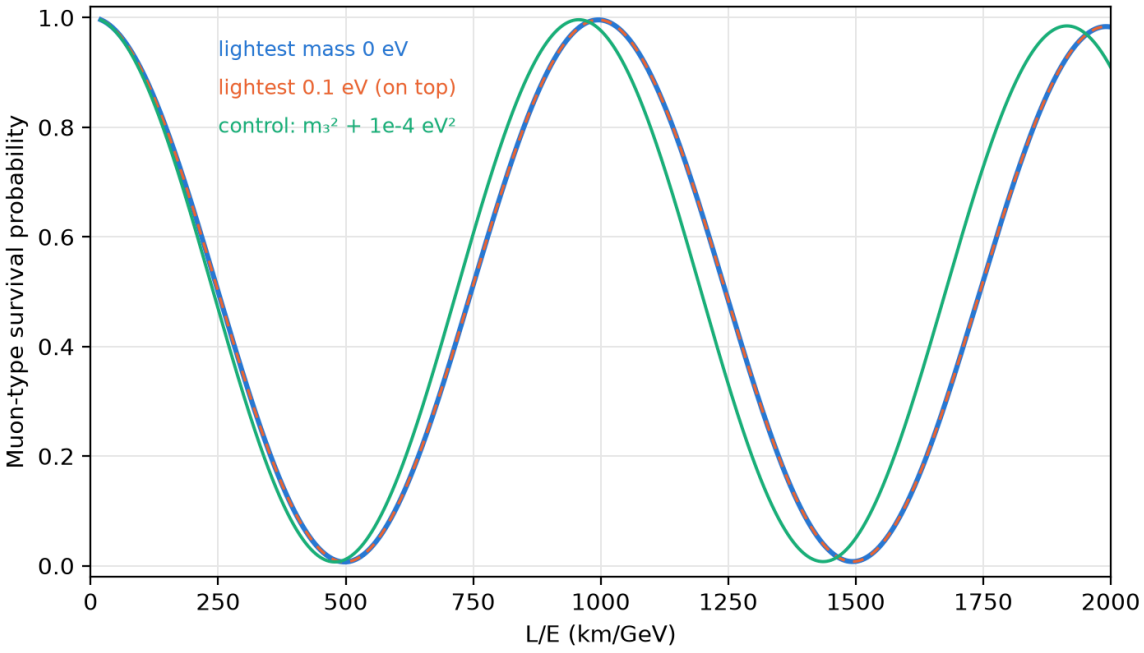


Figure 1. Muon-type survival probability (normal ordering, phase 0). The lines with the lightest mass at 0 eV and at 0.1 eV lie on top of each other and look like one. As a control, shifting only the third square by 10^{-4} eV^2 moves the positions of the dips.

So far this is the form with the energy expanded around the momentum.Keeping the unexpanded $E = \sqrt{p^2 + m^2}$, the shift is no longer a common factor and leaks very slightly into the probability.The electron-type survival probability was computed to 60 digits and the difference between lightest masses 0 and 0.1 eV was taken.

setting	unexpanded formula	expanded formula
reactor type (3 MeV, 50 km)	4.485×10^{-17}	3.889×10^{-62}
atmospheric type (1 GeV, 1000 km)	1.698×10^{-22}	3.112×10^{-61}

In the expanded formula, the difference vanishes down to the rounding size of 60 digits.In the unexpanded formula it is not zero, but even in the reactor type it is of order 10^{-17}.“Oscillation does not fix the masses themselves” is exact within the expanded formula and lies far below any measurable precision in the unexpanded one.

6. How this differs from acoustic beats

Superposing two frequencies produces beats.Paper 672 treated two tones versus one wavering tone from the listener’s side, and Paper 649 the beat between two tidal constituents.Neutrino oscillation is also a beat, between mass eigenstates.But the response to a common shift differs.

Superpose 440 Hz and 443 Hz and raise both by 100 Hz.The waveform reaching the ear (the real part) moves by up to 3.991439, and the average pitch heard rises from 441.5 Hz to 541.5 Hz.The beat stays at 3.0 Hz.The absolute square of the same two complex waves moves by at most 3.639×10^{-12}, the size of double-precision rounding.

In sound, the average pitch is heard.In a probability, the average survives nowhere in the formula.The interference term of two waves is only $2ab\cos(\Delta\omega t)$, and the average $\bar{\omega}$ does not appear.The rewriting of sums into products is the same, but whether the shift is visible depends on whether what is measured is the real part or the absolute square.

7. The floor set by the differences

Knowing only the differences still fixes a floor.Setting the lightest mass to 0, the other two are fixed by square roots of the differences.

ordering	m_1	m_2	m_3	sum	effective mass
normal ($m_1 = 0$)	0	0.008678	0.050302	0.058980	0.008833
inverted ($m_3 = 0$)	0.049535	0.050289	0	0.099824	0.049220

The unit is eV.In the normal ordering m_2 is exactly the square root of Δm^2_{21}, and the inverted ordering has the larger sum.The direct-measurement bound of 0.45 eV lies 50.94 times (normal) and 9.14 times (inverted) above the smallest effective mass.The effective mass reaches exactly 0.45 eV when the lightest mass is 0.449913 eV (normal, sum 1.352627 eV) or 0.447300 eV (inverted, sum 1.347453 eV).The differences fix the bottom but not the top.

8. What answers to the absolute scale is the shape of the endpoint

The electrons emitted in the β decay of tritium run out at an upper end, the endpoint.Near the endpoint, with ε the energy measured from the endpoint, the number of electrons takes the form

$$\frac{dN}{d\varepsilon} \propto \sum_i |U_{ei}|^2 \, \varepsilon \sqrt{\varepsilon^2 - m_i^2} \qquad (\varepsilon \geq m_i)$$

(the form of Fermi (1934), with factors that vary slowly near the endpoint set constant).Here the squared masses themselves appear.

The number within W of the endpoint has the closed form $\sum_i |U_{ei}|^2 (W^2 - m_i^2)^{3/2}/3$.With $m = 0.45$ eV and $W = 1$ eV, numerical integration and the closed form agree at 0.237396757531.The deficit relative to zero mass is as follows ($W = 1$ eV).

ordering, lightest mass	effective mass	deficit (three masses)	deficit (one effective mass)	$\frac{3}{2}m_\beta^2$
normal, 0 eV	0.008833	1.169834×10^{-4}	1.170343×10^{-4}	1.170366×10^{-4}
inverted, 0 eV	0.049220	3.631611×10^{-3}	3.631660×10^{-3}	3.633862×10^{-3}
normal, 0.05 eV	0.050774	3.864492×10^{-3}	3.864543×10^{-3}	3.867037×10^{-3}
normal, 0.10 eV	0.100389	1.507883×10^{-2}	1.507888×10^{-2}	1.511704×10^{-2}
normal, 0.45 eV	0.450087	2.879142×10^{-1}	2.879142×10^{-1}	3.038670×10^{-1}

The deficit computed with the three masses and that computed with the single effective mass $m_\beta = \sqrt{\sum_i |U_{ei}|^2 m_i^2}$ differ by at most 4.356×10^{-4} in relative terms.The endpoint reads this one weighted mean.

Now apply the shift of Section 5.Adding c to every m_i^2 moves m_β^2 by $c \sum_i |U_{ei}|^2$.Since the squares along one row of the mixing matrix sum to 1, the movement is exactly c (largest discrepancy 2.776×10^{-17}).The common constant that oscillation throws away, the endpoint takes as it is.

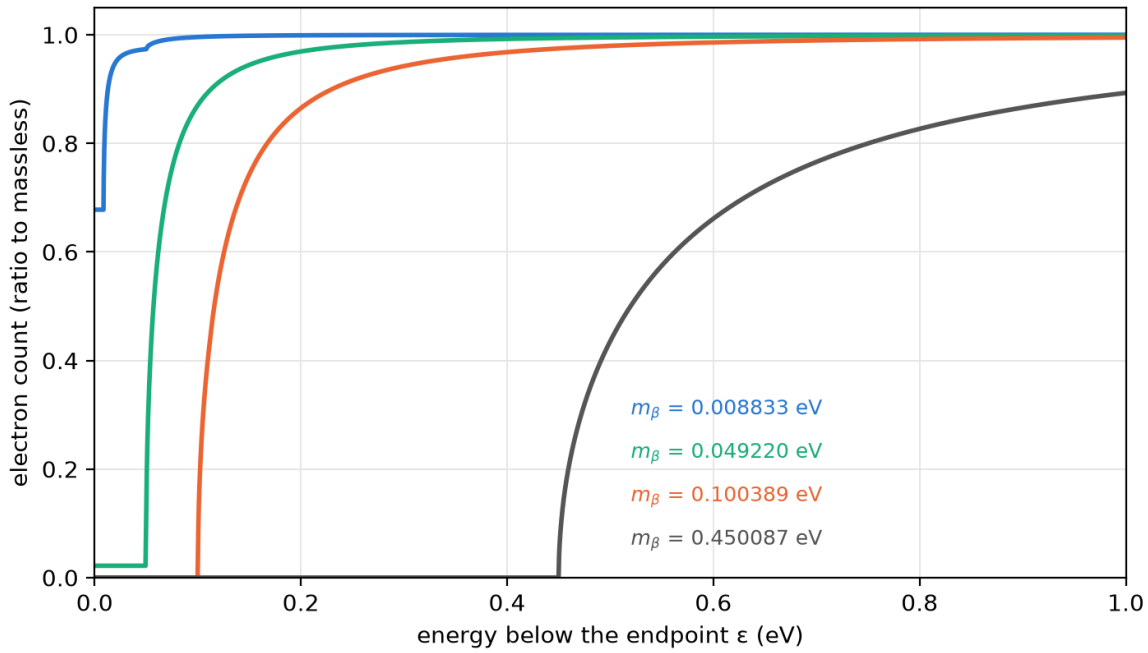


Figure 2. Number of electrons near the endpoint (ratio to zero mass). On the line with a small effective mass, steps appear at the threshold of each of the three masses. The larger the effective mass, the farther from the endpoint the deficit spreads.

The direct measurement (KATRIN 2025) also takes the squared mass itself as its fit variable.The best fit $m^2 = -0.14\ \text{eV}^2$ came out negative through statistical fluctuation, and the bound of 0.45 eV is derived from it.This contrasts with oscillation measurements, which fit differences.

9. The separator: whether one measures oscillation or the endpoint

Applying the same shift c, the two ways of measuring are set side by side (normal ordering).

lightest mass	shift c (eV^2)	movement of oscillation probability	endpoint deficit ($W = 1$ eV)
0 eV	0	0	1.169834×10^{-4}
0.01 eV	0.0001	4.552×10^{-14}	2.669738×10^{-4}
0.05 eV	0.0025	5.512×10^{-14}	3.864492×10^{-3}
0.10 eV	0.0100	2.335×10^{-13}	1.507883×10^{-2}
0.45 eV	0.2025	4.480×10^{-12}	2.879142×10^{-1}

The oscillation column stays within double-precision rounding, while the endpoint column moves by three orders of magnitude or more.Oscillation sees differences of squares and does not see a common constant.The endpoint sees a weighted mean of squares and takes the common constant exactly.The separator is whether one measures oscillation or the β-decay endpoint.

10. Relation to earlier papers

Paper 913 showed that the one half of kinetic energy is the reciprocal of the power 2. Here the one half of oscillation was counted as coming from the same formula with momentum and mass exchanged (Section 2).

Paper 600 counted that calling two consequences of one formula one root is no judgement at all. Following that rule, the two halves are not called one root.

Paper 1060 showed that in a system with only one scale factor the ratio is determined but the position is not. Here too something is fixed and something is not. But the freedom there is a multiplicative factor, and the freedom here is an additive shift. In Section 5, making the shift multiplicative moved the probabilities by 0.864572, so the two are not called one root.

Paper 60, in its second edition, wrote that a chosen 4π for mass and the 4π of solid angle differ in nature. Here the 4π of the oscillation length was added to the comparison and separated from solid angle by moving the dimension (Section 4).

Paper 1055, Paper 1056 and Paper 1058 separated numbers that move with the units from numbers that do not, and showed that exactness comes in kinds. Here the practical coefficient 1.266933 lies on the side that moves with the units, and the denominator 4 on the side that does not (Section 3).

Paper 672 and Paper 649 treated beats between two frequencies. Here the same rewriting was seen to separate the visibility of a shift according to whether the real part is heard or the absolute square is measured (Section 6).

Paper 300 showed that whether two things share a root is decidable. By that criterion, the 4π of the oscillation length and solid angle were judged to have different roots.

Closing

Closing: neutrino oscillation fixes only the differences of the squared masses, not the masses themselves.Shifting every square by the same amount leaves the probabilities unmoved: what remains in double precision is at most 0.519400 times the rounding of the phase, at 60 digits 3.889×10^{-62}, while the mass sum moves from 0.058980 eV to 1.352886 eV.The endpoint takes the same shift as it is: the square of the effective mass moves by exactly the shift (discrepancy 2.776×10^{-17}), and the deficit within 1 eV moves from 1.169834×10^{-4} to 2.879142×10^{-1}.The 4 of the phase is 2 times 2: one half from the expansion and one half from the half-angle; mistaking it misses by 9.888×10^{-1}.The coefficient moves with the units and the 4 does not: 1.266933 moves by 10^{6}, and the recovered denominator is 4.000000000000 every time.The 4π of the oscillation length is not a solid angle: moving the dimension moves only the area of the unit sphere, and the two are the same number only in three dimensions.Stated plainly, in the unexpanded formula the shift leaks by about 4.485×10^{-17}. Matter effects, wave packets and a fourth type are not entered.The separator: whether one measures oscillation or the β-decay endpoint. Oscillation sees differences and throws the common constant away; the endpoint sees a weighted mean and takes that constant.

References

1. Aker, M., et al. (KATRIN Collaboration) (2025). Direct neutrino-mass measurement based on 259 days of KATRIN data. *Science*.
2. Fermi, E. (1934). Versuch einer Theorie der β-Strahlen. *Zeitschrift für Physik*.
3. Fukuda, Y., et al. (Super-Kamiokande Collaboration) (1998). Evidence for Oscillation of Atmospheric Neutrinos. *Physical Review Letters*.
4. Giunti, C., & Kim, C. W. (2007). *Fundamentals of Neutrino Physics and Astrophysics*. Oxford University Press.
5. Maki, Z., Nakagawa, M., & Sakata, S. (1962). Remarks on the Unified Model of Elementary Particles. *Progress of Theoretical Physics*.
6. Navas, S., et al. (Particle Data Group) (2024). Review of Particle Physics. *Physical Review D*.
7. Pontecorvo, B. (1968). Neutrino Experiments and the Problem of Conservation of Leptonic Charge. *Soviet Physics JETP*.
8. Yamagishi, Y. (2026). *c as the Ball of Velocity Space* [Paper 60]. Zenodo. 10.5281/zenodo.21598012
9. Yamagishi, Y. (2026). *The Three Hundredth Census: Whether Two Things Share a Root Is Decidable* [Paper 300]. Zenodo. 10.5281/zenodo.22171914

10. Yamagishi, Y. (2026). *The Six Hundredth Census: The Warning of the Three Hundredth Came True, but Not in the Form It Feared* [Paper 600]. Zenodo. 10.5281/zenodo.22805283

11. Yamagishi, Y. (2026). *Tide Tables Reach a Century Ahead Not by Solving the Tide but by Taking It Apart* [Paper 649]. Zenodo. 10.5281/zenodo.23014639

12. Yamagishi, Y. (2026). *What Decides Between "Two Tones" and "One Wavering Tone" Is Not the Sound but the Listener* [Paper 672]. Zenodo. 10.5281/zenodo.23014751

13. Yamagishi, Y. (2026). *The* **1/2** *of Kinetic Energy Is One Over the Power* **2**, *and the* **1** *of Light and the* **1** *of a Rolling Hoop Have Different Roots* [Paper 913]. Zenodo. 10.5281/zenodo.22805027

14. Yamagishi, Y. (2026). *The Speed of Light Is Near Three Hundred Million Because Length Is Decimal and Time Is Sexagesimal* [Paper 1055]. Zenodo. 10.5281/zenodo.22905177

15. Yamagishi, Y. (2026). *The Fine-Structure Constant Does Not Move with the Units, but It Moves with Energy* [Paper 1056]. Zenodo. 10.5281/zenodo.22905436

16. Yamagishi, Y. (2026). *There Are Two Kinds of Exactness: One Is Set by the Units, the Other Is Unmoved by Continuous Deformation* [Paper 1058]. Zenodo. 10.5281/zenodo.22914785

17. Yamagishi, Y. (2026). *In a System with Only One Scale Factor, the Ratio Is Determined but the Position Is Not* [Paper 1060]. Zenodo. 10.5281/zenodo.22915151

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