

NuFIT 3.0: Three-neutrino fit based on data available in November 2016

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ABSTRACT: We present updated results for our global analysis of solar, atmospheric, reactor, and accelerator neutrino data in the framework of three-neutrino oscillations. We also provide χ^2 tables for the various one- and two-dimensional projections of the global analysis. If you use these results, please refer to both [1] and [2].

Solar experiments

- Chlorine total rate [3], 1 data point.
- Gallex & GNO total rates [4], 2 data points.
- SAGE total rate [5], 1 data point.
- SK1 full energy and zenith spectrum [6], 44 data points.
- SK2 full energy and day/night spectrum [7], 33 data points.
- SK3 full energy and day/night spectrum [8], 42 data points.
- SK4 2055-day day-night asymmetry [9] and 2365-day energy spectrum [10], 24 data points.
- SNO combined analysis [11], 7 data points.
- Borexino Phase-I 740.7-day low-energy data [12], 33 data points.
- Borexino Phase-I 246-day high-energy data [13], 6 data points.
- Borexino Phase-II 408-day low-energy data [14], 42 data points.

Atmospheric experiments

- IceCube/DeepCore 3-year data [15, 16], 64 data points.

Reactor experiments

- KamLAND combined DS1 & DS2 spectrum [17], 17 data points.
- CHOOZ energy spectrum [18], 14 data points.
- Palo-Verde total rate [19], 1 data point.
- Double-Chooz FD-I (461 days) and FD-II (212 days) spectra [20], 54 data points.
- Daya-Bay 1230-day spectrum [21], 34 data points.
- Reno 800-day near & far total rates [22], 2 data points (with free normalization).
- SBL reactor data (including Daya-Bay total flux at near detector), 77 data points [23, 24].

Accelerator experiments

- MINOS 10.71×10^{20} pot ν_μ -disappearance data [25], 39 data points.
- MINOS 3.36×10^{20} pot $\bar{\nu}_\mu$ -disappearance data [25], 14 data points.
- MINOS 10.6×10^{20} pot ν_e -appearance data [26], 5 data points.
- MINOS 3.3×10^{20} pot $\bar{\nu}_e$ -appearance data [26], 5 data points.
- T2K 7.48×10^{20} pot ν_μ -disappearance data [27, 28], 28 data points.
- T2K 7.48×10^{20} pot ν_e -appearance data [27, 28], 5 data points.
- T2K 7.47×10^{20} pot $\bar{\nu}_\mu$ -disappearance data [27, 28], 63 data points.
- T2K 7.47×10^{20} pot $\bar{\nu}_e$ -appearance data [27, 28], 1 data point.
- NO ν A 6.05×10^{20} pot ν_μ -disappearance data [29], 18 data points.
- NO ν A 6.05×10^{20} pot ν_e -appearance data [29], 10 data points.

Description of the χ^2 data tables

We provide two gzip-compressed files (one for Normal and one for Inverted Ordering) containing the χ^2 data tables for our global analysis. Each file is divided into 21 sections, identified by a unique tag and corresponding to a particular one- or two-dimensional projections. The tags and the meaning of the data columns for each section are listed below (note that $\ell = 1$ for NO and $\ell = 2$ for IO).

N°	Section tag	1 st column	2 nd column	3 rd column
1	# T13/T12	$\sin^2 \theta_{13}$	$\sin^2 \theta_{12}$	$\Delta\chi^2$
2	# T13/DMS	$\sin^2 \theta_{13}$	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\Delta\chi^2$
3	# T12/DMS	$\sin^2 \theta_{12}$	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\Delta\chi^2$
4	# T13/T23	$\sin^2 \theta_{13}$	$\sin^2 \theta_{23}$	$\Delta\chi^2$
5	# T13/DMA	$\sin^2 \theta_{13}$	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\Delta\chi^2$
6	# T23/DMA	$\sin^2 \theta_{23}$	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\Delta\chi^2$
7	# T13/DCP	$\sin^2 \theta_{13}$	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$
8	# T23/DCP	$\sin^2 \theta_{23}$	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$
9	# DMA/DCP	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$

N°	Section tag	1 st column	2 nd column	3 rd column
10	# T12/T23	$\sin^2 \theta_{12}$	$\sin^2 \theta_{23}$	$\Delta\chi^2$
11	# T12/DCP	$\sin^2 \theta_{12}$	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$
12	# T12/DMA	$\sin^2 \theta_{12}$	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\Delta\chi^2$
13	# DMS/T23	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\sin^2 \theta_{23}$	$\Delta\chi^2$
14	# DMS/DCP	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$
15	# DMS/DMA	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\Delta\chi^2$
16	# T13	$\sin^2 \theta_{13}$	$\Delta\chi^2$	—
17	# T12	$\sin^2 \theta_{12}$	$\Delta\chi^2$	—
18	# T23	$\sin^2 \theta_{23}$	$\Delta\chi^2$	—
19	# DCP	$\delta_{\text{CP}} / [\text{deg}]$	$\Delta\chi^2$	—
20	# DMS	$\log_{10}(\Delta m_{21}^2 / [\text{eV}^2])$	$\Delta\chi^2$	—
21	# DMA	$\Delta m_{3\ell}^2 / [10^{-3} \text{ eV}^2]$	$\Delta\chi^2$	—

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