NuFIT 2.0: Three-neutrino fit based on data available in September 2014

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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 1669-day energy spectrum and day/night asymmetry [9], 24 data points.
- SNO combined analysis [10], 7 data points.
- Borexino 740.7-day low-energy data [11], 33 data points.
- Borexino 246-day high-energy data [12], 6 data points.

Atmospheric experiments

- SK1–4 (including SK4 1775-day) combined data [13], 70 data points.

Reactor experiments

- KamLAND combined DS1 & DS2 spectrum [14], 17 data points.
- CHOOZ energy spectrum [15], 14 data points.
- Palo-Verde total rate [16], 1 data point.
- Double-Chooz 227.9-day spectrum [17], 18 data points.
- Daya-Bay 621-day spectrum [18], 36 data points.
- Reno 800-day near & far total rates [19], 2 data points (with free normalization).
- SBL reactor data (including Daya-Bay total flux at near detector), 77 data points [18, 20].

Accelerator experiments

- MINOS 10.71×10^{20} pot ν_μ-disappearance data [21], 39 data points.
- MINOS 3.36×10^{20} pot $\bar{\nu}_\mu$-disappearance data [21], 14 data points.
- MINOS 10.6×10^{20} pot ν_e-appearance data [22], 5 data points.
- MINOS 3.3×10^{20} pot $\bar{\nu}_e$-appearance data [22], 5 data points.
- T2K 6.57×10^{20} pot ν_μ-disappearance data [23], 16 data points.
- T2K 6.57×10^{20} pot ν_e-appearance data [24], 5 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 "Free+RSBL" analysis [1]. 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`	$\sin^2\theta_{13}$	$\log_{10}(\Delta m^2_{21} \,/\, [\text{eV}^2])$	$\Delta\chi^2$
3	`# T12/DMS`	$\sin^2\theta_{12}$	$\log_{10}(\Delta m^2_{21} \,/\, [\text{eV}^2])$	$\Delta\chi^2$
4	`# T13/T23`	$\sin^2\theta_{13}$	$\sin^2\theta_{23}$	$\Delta\chi^2$
5	`# T13/DMA`	$\sin^2\theta_{13}$	$\Delta m^2_{3\ell} \,/\, [10^{-3}\ \text{eV}^2]$	$\Delta\chi^2$
6	`# T23/DMA`	$\sin^2\theta_{23}$	$\Delta m^2_{3\ell} \,/\, [10^{-3}\ \text{eV}^2]$	$\Delta\chi^2$
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`	$\Delta m^2_{3\ell} \,/\, [10^{-3}\ \text{eV}^2]$	$\delta_{\text{CP}} \,/\, [\text{deg}]$	$\Delta\chi^2$
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`	$\sin^2\theta_{12}$	$\Delta m^2_{3\ell} \,/\, [10^{-3}\ \text{eV}^2]$	$\Delta\chi^2$
13	`# DMS/T23`	$\log_{10}(\Delta m^2_{21} \,/\, [\text{eV}^2])$	$\sin^2\theta_{23}$	$\Delta\chi^2$
14	`# DMS/DCP`	$\log_{10}(\Delta m^2_{21} \,/\, [\text{eV}^2])$	$\delta_{\text{CP}} \,/\, [\text{deg}]$	$\Delta\chi^2$
15	`# DMS/DMA`	$\log_{10}(\Delta m^2_{21} \,/\, [\text{eV}^2])$	$\Delta m^2_{3\ell} \,/\, [10^{-3}\ \text{eV}^2]$	$\Delta\chi^2$

N°	Section tag	1^{st} column	2^{nd} column	3^{rd} column
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`	δ_{CP} / [deg]	$\Delta\chi^2$	—
20	`# DMS`	$\log_{10}(\Delta m^2_{21}$ / [eV^2])	$\Delta\chi^2$	—
21	`# DMA`	$\Delta m^2_{3\ell}$ / [10^{-3} eV^2]	$\Delta\chi^2$	—

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